TECHNOLOGY DEPARTMENT

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SHOW OPENS 'SELL AGAIN' DRIVE

INSIDE DOPE

by GEORGE F. TAUBENECK

Stories of the Week
Economic Dilemma
You Tell Me Your Dream
Intolerance
Women Are Impatient—Darn It!
There's a Housing Shortage...
Fat Face
Write Your Own Caption
Advertisers' Holiday
Big Business
Men Are All Alike
Women Have Claws
Where There's Smoke, No Fire May Have Occurred

Stories of the Week

Four more good sports yarns:

The colorful "Go— y" Gomez of the New York Yankees once was cornered by an earnest high school journalist.

"And to what do you attribute your success, Senor Gomez?" inquired the bright-eyed reporter.

"El Goofo" shifted his cud of Mail Pouch chewing tobacco, reflected momentarily, and then replied:

"To clean living, and a great outfield."

One of America's best-known movie stars loves money and practical jokes about 50-50. While cavorting around a 36-hole Los Angeles course one day, this gilt-edged prankster approached a green just in time to see a ball come sailing out of woods and land a few yards in front of him. Calmly the actor picked up the ball, dropped it into the hole, and awaited developments.

In a few moments a fat man came charging up to the green, noted that he had holed out (apparently) and grunted:

"Um. Well, that gives me 14 for the hole."

Toward the end of the 1947 baseball season, Larry MacPhail invited two-score Diamond Immortals to play a five-inning game in Yankee Stadium. Most of these Hall-of-Fame Old-Timers showed up, and had a grand time.

And Tyrus Raymond Cobb, the greatest of them all, was in fine form. When he came up to bat, he turned around to catcher Wally Schang and mourned:

"Haven't had a bat in my hands for 15 years, Wally. Look out, old friend. Better step back a couple of yards. Wouldn't want the bat to slip away and bust you on the noggin."

Schang dutifully stepped 'way back.

On the first pitch, the villainous Cobb laid down a perfect bunt, and made first base easily.

Florida's freshman Congressman, Rep. I. W. Hawkins, used to be a sportswriter himself. As such, he took the rap for many typographical errors. But the haunting memory of all these "typos" came back to roost when he read, in a local county weekly:

"Rep. Hawkins, who returned from Washington two weeks ago, has been in bed ever since with a bad coed."

Economic Dilemma

Waxing philosophical the Pullman club-car conversationalist opined:

"Now you take this suit of mine. I bought it in New York. But the fabric was woven in England of wool which came from Australia. The tailoring house is located in Rochester. This firm buys its thread from India, hires laborers from

(Continued on Page 34, Column 1)

Provisions In Some New Codes Alarm Many In Industry

DETROIT — Refrigeration codes are arousing increasing interest among the industry and in local governments, after having been dormant during the war years when the chief concern of all factors was to produce for the war effort and maintain the existing equipment in operation.

With the return to peacetime conditions, however, several municipalities have revised their codes to bring them in line with advances in the science of refrigeration and air conditioning, and other communities have instituted codes for the first time.

Among some of the latter there has been tendency to make these codes something more than simply safety codes which would set up rules to provide for the safe use and installation of refrigeration equipment. Rather, the codes are regulatory ordinances which tend to sharply limit those who are legally permitted to engage in the refrigeration business as sales outlets, contractors, or servicemen.

Several manufacturers have expressed much concern over this trend, for they feel that it will possibly curtail the growth of the refrigeration industry as a whole.

Such an ordinance was recently put into effect by a small city. It deals almost solely with regulations as to who may sell, install, and/or service refrigeration equipment. There is only one direct reference to safety requirements in the code, other than the provisions for the appointment of a City Refrigeration Inspector who will have charge of inspections which presumably will be made in the interests of safety.

This single reference reads as follows:

"No refrigeration work shall be hidden from view in any manner, including pipe covering and flooring,

(Concluded on Page 2, Column 4)

Cylinder Shortage Hits 'Freon' Supply

WILMINGTON, Del. — A scarcity of "Freon-12" fluorinated refrigerant is ahead unless users stop hoarding shipping cylinders or sending them out of the country, Kinetic Chemicals, Inc., warned last week.

The situation is critical for the vital deliveries that start in February and extend through the spring and summer. Return of empties has dropped so low in the last three months that, unless there is an immediate change, production of the refrigerant and its distribution in cylinders will have to be cut.

Kinetic officials say that for eight months they have been shipping

(Concluded on Page 80, Column 5)

Heating, Ventilating Show Opens Feb. 2

NEW YORK CITY—Approximately 300 exhibitors will be ready to display their latest products when the doors are opened at 2 p.m. next Monday, Feb. 2, for the Eighth International Heating and Ventilating Exposition.

Sponsored by the American Society of Heating & Ventilating Engineers, the exposition will be held in Grand

(Concluded on Page 77, Column 2)

Dealer Program Set on Franchise Trade-In Plans

By John O. Sweet

CHICAGO—For two and a half hours last Wednesday, representatives of nearly 40 appliance manufacturers heard and commented on what the National Electrical Retailers Association has decided to do and what it would like them, distributors, and electric companies to do about vital dealer problems.

The manufacturer-dealer panel climaxed NERA's three-day Leadership Conference during which some 90 appliance-radio retailers came to agreement on committee reports and recommendations covering seven subjects.

The subjects were manufacturer-

(Concluded on Page 80, Column 1)

Weber Cuts Prices 10% on Fixtures

LOS ANGELES — Price reductions averaging 10% on all commercial refrigeration equipment made by Weber Showcase & Fixture Co. here have just been announced by H. M. Brundage, recently appointed vice president in charge of sales.

"We must take an optimistic view of the future," Brundage said, "and we feel the increased volume of sales because of lower prices will enable the firm and its dealers to operate profitably. It is our hope other members of the industry will follow suit."

Baker Outlets Will Handle Marlo Line

SOUTH WINDHAM, Me. — The Baker Ice Machine Co., Inc. announces the completion of an agreement with the Marlo Coil Co., of St. Louis, under which the line of Marlo heat transfer equipment will be available through all Baker offices and distributors.

Principal Marlo products to be handled by Baker in conjunction with its own line of "Freon-12" and ammonia compressors and equipment include: Marlo evaporative condensers and coolers, air conditioning units, industrial blower units, cooling towers, and other Marlo air conditioning and refrigeration apparatus.

New Products Give Industry Means To Maintain Volume

CLEVELAND — As the Fifth All-Industry Refrigeration & Air Conditioning Exposition opens here with the greatest display of refrigeration and air conditioning products ever to be shown, those attending will be girding themselves for the first real postwar battle for business in the markets which they sell.

All available figures reveal that industry sales since the end of the War have expanded to a point beyond even the highest estimates made by industry authorities in the late War years. But there is evidence also that sales of commercial refrigeration equipment in the last few months have dropped off from the peaks reached in the last 18 months.

Refrigeration Equipment Manufacturers Association, sponsor of the Show, realized that 1948 would be a critical year for sales of refrigeration and air conditioning equipment and supplies, and has emphasized the following as the keynote for the Show:

"Sales CAN be great in '48 . . . SELL!"

The Show is expected to uncover many new products in the exhibits of 175 manufacturers with which dealers and contractors can break down any mounting sales resistance or tap new markets.

That the market for commercial refrigeration and air conditioning equipment has expanded beyond the dreams of the industry's most optimistic sales chiefs is demonstrated by the sales figures that have been compiled since the War's end.

Sales of commercial-size condensing units, which is the over-all indicator of commercial and air conditioning sales, should go over 1,200,000 units for 1947. (Bureau of Census figures for the first nine months showed total condensing unit sales of 922,000 units, and some observers believe these figures are relatively low.)

Now let's see what the best "guestimates" made at the end of the war predicted.

The War Production Board Task Committee report on refrigeration said that "a million condensing units a year will be sold, but it will be some time before that figure is actually accomplished." The Airtemp market survey, which gained considerable respect in industry circles, predicted that that "million a year" figure would not be reached until V-Day plus 5, which meant about 1951. When E. A. Terhune, then with Servel, estimated that a figure of 800,000 a year would be reached in 1947 he was considered wildly over-enthusiastic.

But the fact remains that Census figures for the third-quarter of 1947 showed an over-all decrease of 11% in air conditioning and commercial refrigeration shipments, and a decrease of 12% in compressors—the first time since the end of the war that the upward trend has been reversed. Following is the record of condensing unit sales (Census figures) for the last four quarters recorded:

	Total	Open	Hermetic
4th—1946	269,136	.....	.....
1st—1947	309,681	129,653	168,448
2nd—1947 ...	319,542	140,534	167,483
3rd—1947 ...	293,238	117,940	166,032

Show Facts In Brief

Place: Cleveland Public Auditorium.

Show Hours:

Monday, Jan. 26

10 a.m. to 2 p.m.—Preview for Refrigeration Equipment Wholesalers.

2 p.m. to 10 p.m.—Open to all.

Tuesday, Jan. 27

12 to 6 p.m.—Open to Refrigeration Contractors, Service Engineers, and Dealers only.

Wednesday, Jan. 28

12 to 6 p.m.—Open to all.

Thursday, Jan. 29

10 a.m. to 4 p.m.—Open to all.

Who can get in: Only those with legitimate connection with the industry. Bring business card or letterhead.

If you haven't got hotel accommodations: You'd best do one of three things. (1) get into Cleveland, see the show, and get out the same day; (2) plan to stay in some nearby city such as Akron; (3) come near the end of the show and take a chance on finding a check-out.

Information on accommodations can be obtained at a Housing Desk that will be maintained near the Show Registration desk.

Social Events: All-Industry Exposition Banquet at 7:30 p.m. Wednesday, Jan. 28. Information on this will probably be available at registration desk.

(See page 10 for Master Program of events in connection with Show.)

Aminco Products Co. Formed In Detroit

DETROIT—Formation of Aminco Refrigeration Products Co. to take over the refrigeration division of American Injector Co. has been announced by E. "Ed" Kellie and John L. Trix.

Ed Kellie is president of the new organization while John Trix serves as secretary-treasurer.

In effect, the refrigeration division of American Injector is now being operated by Aminco Refrigeration Products Co.

Guarantees and warranties on the American Injector line of products

(Concluded on Page 77, Column 1)

Men Who Planned the All-Industry Show

These are some of the men primarily responsible for making the 5th All-Industry Show the greatest in history. F. J. Hood of Ansul Chemical Co. (center), chairman of the Show committee confers on the program with J. A. Strachan, the Weatherhead Co. (left) and R. J. Hanson (right), executive secretary of Rema and Show director.

Heads Jacobs Purchasing

DETROIT — Clarence M. (Red) Strong has been named director of purchases of F. L. Jacobs Co., manufacturer of the Launderall automatic home laundry and beverage coolers.

Strong will be in charge of purchasing for all plants of the company and its subsidiaries.

December Retail Sales 9% Over '46 Period

WASHINGTON, D. C. — Retail sales in December increased 21% over November and were 9% better than sales in December, 1946.

Furniture stores showed the biggest gains over 1946—22%.

Wall WIRE PRODUCTS COMPANY
PLYMOUTH • MICHIGAN
Makers of
REFRIGERATOR SHELVES • STAMPINGS
FORMED AND WELDED PRODUCTS

Who has not heard the housewife remarking with pride of the Stainless Steel Shelves in her refrigerator

Some Steel Producers Not Accepting Orders

NEW YORK CITY — Some steel producers are refusing to accept orders for delivery in the second quarter, it is reported here.

Steel companies have been allocating products to customers, and allotments for delivery in the first quarter have been reduced. As a result many still mills carry over into April much business which could not be filled in the first quarter.

The steel industry meanwhile has pledged full cooperation with voluntary industry programs to allocate steel and steel products, and an advisory committee is being named to work with government officials.

The industry apparently does not favor the proposal made by Henry J. Kaiser that the industry create and finance an "impartial" steel anti-inflation commission which would hold public hearings on any proposed allocation of steel. This would be necessary Kaiser said, to assure that allocations would not be solely on an historical basis.

Provisions In New Codes Alarm Many--

(Concluded from Page 1)

nor shall it be enclosed in walls until the Refrigeration Inspector has inspected and passed on same. All piping on systems of more than 25 lbs. of refrigerant charge by weight must be subjected to a pressure test using dry carbon dioxide or nitrogen under a pressure 100% above normal working pressure or not to exceed manufacturers' specifications. This test must be on the piping with a suitable gauge mounted when the inspector is called for inspection.

"Large systems, using long and complicated runs of piping and tubing, may be inspected in sections, however, the same pressure test as herein described shall be put to each part of the system after which a final pressure test shall be put to the system as a whole. A final inspection shall be made when unit is operating before final approval is given."

The above two paragraphs comprise the safety section of this particular code!

Balance of the code—about 99% of it, that is—is devoted to regulations concerning the sales and servicing of refrigeration. For example:

"Every person, firm or corporation desiring to engage in the business of selling, leasing, constructing, installing, altering, disassembling, assembling, repairing and/or servicing any refrigeration system or equipment as defined in this ordinance in any building, structure, public or private premises or grounds within the City of ------- shall first file with the City Controller an application to engage in said business, pay a license fee, post the bond, and in certain instances as herein-after prescribed, qualify by examination of competency to do certain work."

The code's definition of refrigeration equipment is broad, including both compression and absorption type machines.

HITS DOMESTIC DEALER

Note also that apparently even the dealer who confines his refrigeration activities strictly to the sale of household units and does no servicing even of these will have to have a permit from this city to operate his business.

And obtaining a permit requires posting a surety bond of $1,000, the payment of an annual licensing fee of $25, and the satisfaction of certain other requirements as to experience in the business. It is this latter section of the code, particularly, that has aroused the interest of many in the refrigeration industry.

For a firm to hold a license to engage in refrigeration business in this city, it must have in its employ at least one person holding a "Master Refrigeration Mechanic's Certificate." And how does one obtain such a certificate? Explains this ordinance:

"Any person having served four (4) years as an Apprentice Refrigeration Mechanic plus three years as a Journeyman Refrigeration Mechanic in a manner as prescribed in this ordinance and having applied for the examination; passed same with a grade of no less than 75% correct, and having paid the $5 fee is entitled to hold a Master Refrigeration Mechanic's Certificate of Competency provided he pay the renewal fee of $5 annually."

7 YEARS EXPERIENCE

In other words, a man with considerable sales experience but no refrigeration service background who wished to establish a refrigeration sales firm would either have to spend seven years first obtaining the necessary service experience or he would have to hire such a person, whether he planned to do any service work or not, if this ordinance is strictly interpreted.

This also might prove especially discouraging to the young man who wanted to enter the refrigeration business in this particular city.

That's pretty much the way the code situation stands in one city. Meanwhile, as for strictly safety codes, the American Standards Association is now in the process of revising its Safety Code for Mechanical Refrigeration (known to the industry as the "B-9" code) under the leadership of the American Society of Refrigerating Engineers.

REVISING B-9 CODE

This code is intended to serve as a guide for both manufacturers and municipal and state authorities. Close adherence to the B-9 code, say manufacturers and the standards association, will provide local governments with all the safety requirements that are reasonably necessary, and will permit refrigeration equipment to be manufactured, delivered, and installed with less expense to the ultimate consumer.

If a certain city sets up special safety requirements for refrigeration equipment which necessitate the addition or substitution of certain items on the equipment, the machines will naturally cost more than if they were used just as they came off the line.

The A.S.A. B-9 code committees are now in the process of revising the 1939 version to bring it up to date so that safety requirements will be applicable to all the new types of refrigeration equipment.

Dr. William R. Hainsworth represents the A.S.R.E. on the B-9 committee and serves as chairman. Harry D. Edwards of the International Acetylene Association and National Safety Council, is first chairman; E. T. Benson, representing the Air Conditioning and Refrigerating Machinery Association, is second vice chairman, and D. F. Hayes of A.S.A. is secretary.

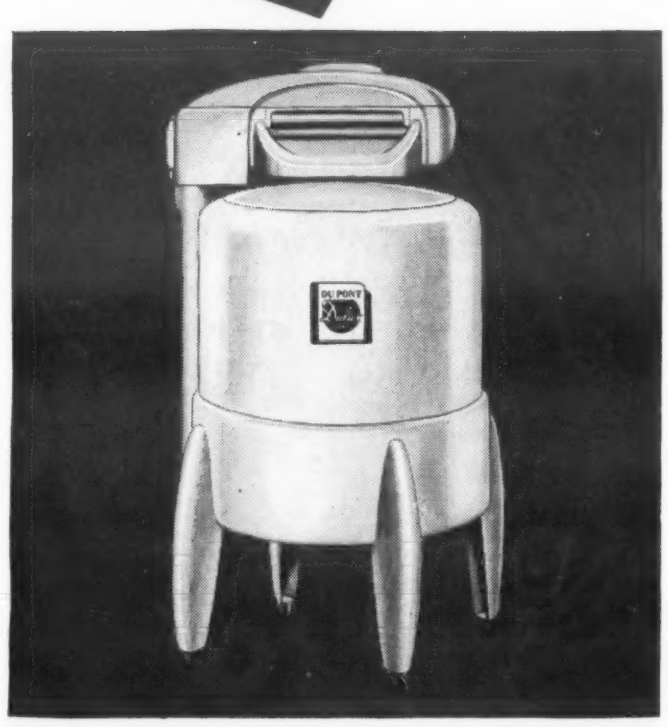
When the customer is ON THE FENCE

It identifies America's leading home appliance finish!

It's good business to let the "Dulux" seal speak for itself. It does so with authority, saying: "Here is a finish that gives *years* of service . . . in color retention, mar resistance, and outstanding good looks." And you can back that up by telling your prospects that "Dulux" enamel is rigidly *pre-tested!*

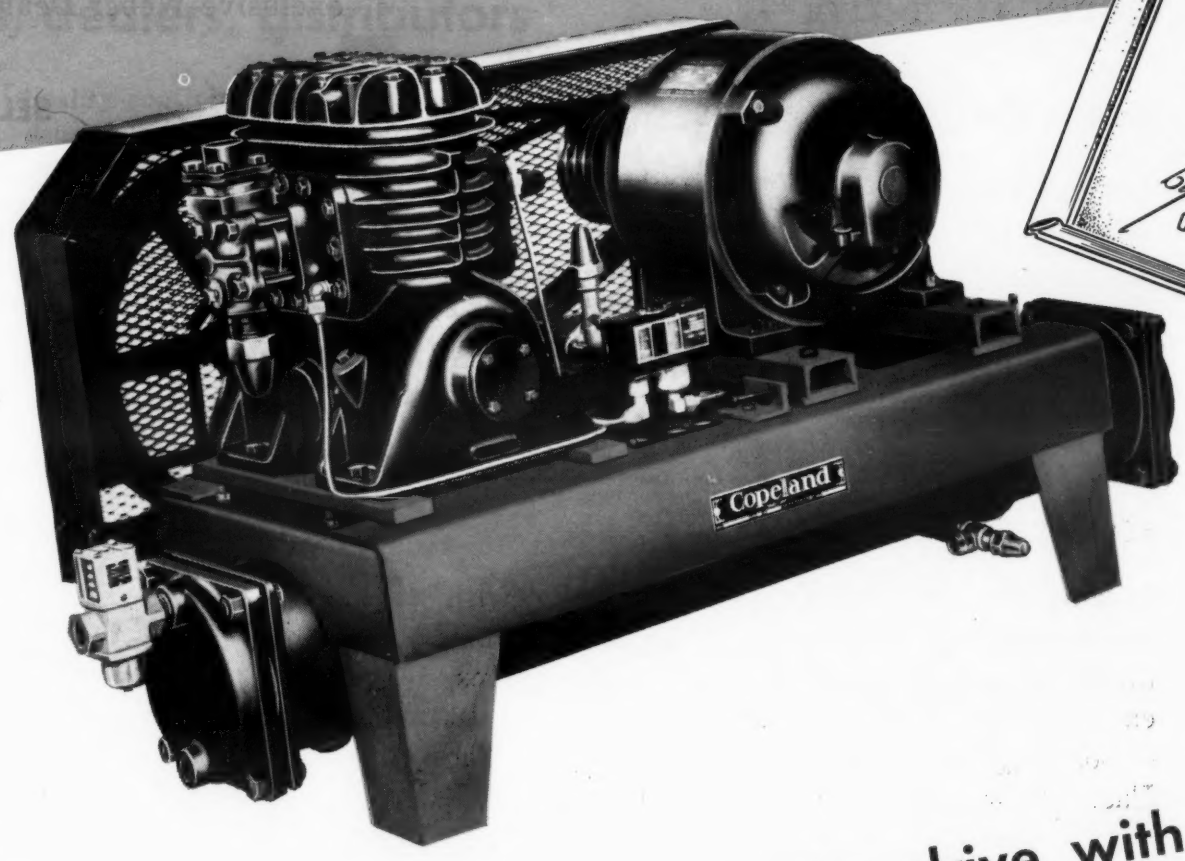
If your manufacturer supplies you "Dulux"-finished ware *without* the seal, ask him to include it hereafter. Use it to help clinch sales *faster!*

E. I. du Pont de Nemours & Co. (Inc.), Finishes Division, Wilmington 98, Delaware.

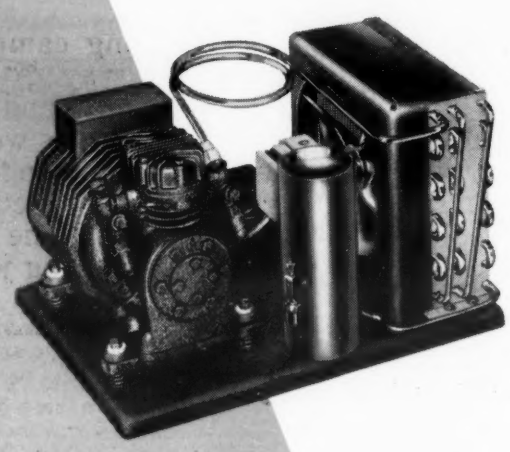


DU PONT DULUX REG. U. S. PAT. OFF.
BETTER THINGS FOR BETTER LIVING...*THROUGH CHEMISTRY*

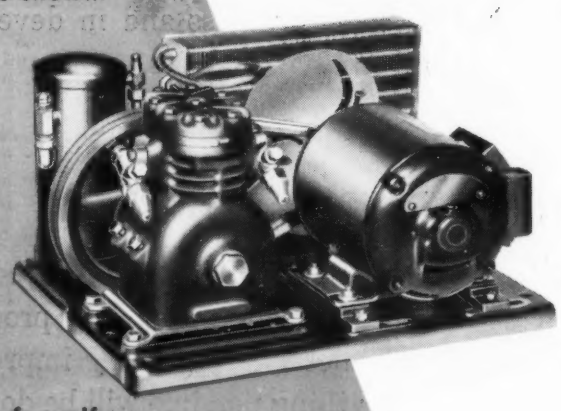
YOU'LL WELCOME COPELAND *Even more in a Buyer's Market!*



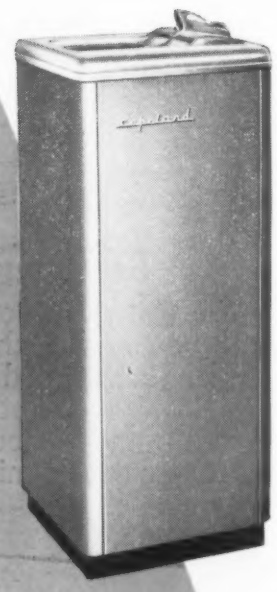
Copeland remote units are sturdy, compact. Air-cooled models from 1/4 H.P. to 3 H.P. inclusive. Water-cooled models from 1/3 H.P. to 7 1/2 H.P. Model 750-W shown.



COPELAMETIC, the Accessible Hermetic, combines the best features of welded-in and open-type units. Eliminates belts, seals, manual oiling. Models from 1/20 H.P. to 3/4 H.P. Model K-33 is shown.



Compact belt-driven units for self-contained installation range from 1/6 H.P. to 1/2 H.P. A model for every range of refrigeration temperature. Model 334 is shown.



Copeland electric water coolers and household refrigerators are smart-looking, low-cost in operation, thoroughly dependable. Shown are the PB-10 water cooler and the CD-489, 9 cubic ft. Deluxe Refrigerator.

Back up your sales drive with a winner. Use Copeland's reputation to assure a successful selling job. You can make a prospect a customer with these Copeland sales points:

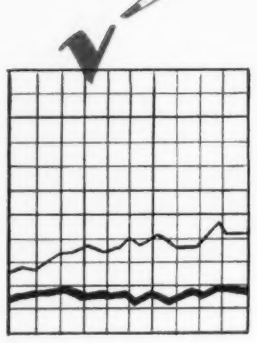
1. Perfection-engineered. Recognized leader for 30 years in research and engineering. Field-proved superiority.
2. Copeland's complete line of refrigeration and air-conditioning units and compressors enables you to quote on any application.
3. Consistent, powerful advertising, directed to your customers, makes selling easy. The Copeland name is favorably recognized.

Copeland
DEPENDABLE *Electric* REFRIGERATION

COPELAND REFRIGERATION CORPORATION ★ SIDNEY, OHIO
New York Office: 71 West 23rd Street
Export Department: 60 Wall Tower, New York City

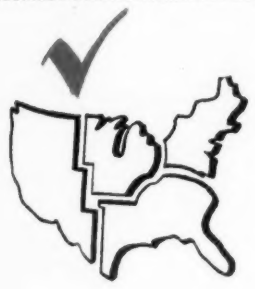
WEBER'S 50 YEARS' EXPERIENCE OFFERS THESE ADVANTAGES FOR DEALER SUCCESS

In celebration of their "Golden Anniversary," Weber is placing 50 years of sales and production experience in their dealers' hands... potent sales and merchandising material... finer equipment to assure greater sales and more profits. To secure his fair share of the local business in drug stores, meat markets, grocery stores, dairy stores, florist shops, super markets, hotels, restaurants, hospitals, and other outlets in which refrigerated equipment is used, a dealer must have the proper "tools." Weber provides these tools... has developed an organization to make them immediately available. Check the 10 advantages exclusive Weber Dealers will have to make 1948 a banner year.



WEBER'S NEW LOW PRICES

Average reductions of 10% on all Commercial Refrigeration Equipment as shown in new price lists recently sent to Weber dealers have established Weber as the first in the industry to join other industrial leaders in their efforts to stop inflation.

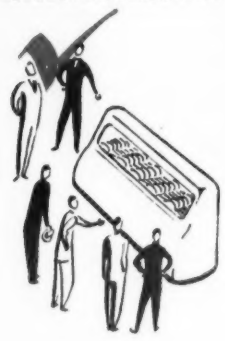


FOUR SALES REGIONS

In order to more efficiently provide its dealers with the proper tools to do a selling job, Weber has divided the United States into 4 sales regions, each having its own Regional Office. The West —Los Angeles... The Midwest—Chicago... The East--New York... The South—to be announced.

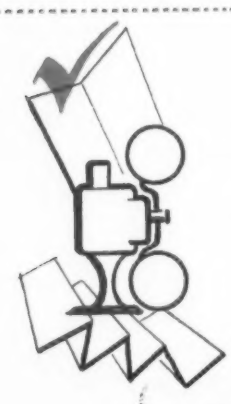
A "HOME OFFICE" IN EACH REGION

Each of the four Regional Offices will be in charge of a Regional Manager who will have a complete Sales, Service, Store-planning, and Training staff under his direction. Thus, in effect, each Regional Office will be a "home office," with the entire resources of the 50-year-old Weber Company available to each dealer right in his own territory.



EACH REGION A COMPLETE UNIT

Each Regional Office will have its own showroom and warehouse facilities. Personnel will include a Store Planning Specialist, Soda Fountain Sales Specialist, a District Manager, a Service Manager, an Office Manager, and a Retail Sales Manager. This decentralization of warehouse stocks and sales organization will result in faster deliveries, fast product servicing and closer personal contact between company, dealer and customer.



TRAINING AIDS

Each region will provide Weber Dealers with specialized training help in both merchandising and servicing of Weber Equipment... more aids for the dealer who knows the most effective selling today is by helping the merchant in merchandising his store—in caring for his equipment—so as to increase his sales and profits.

SELLING AIDS

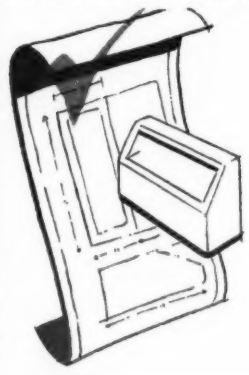
Each region will provide its dealers with the finest selling aids ever turned out by any manufacturer of refrigeration equipment. A completely informative Retail Sales Manual, a comprehensive pocket-size Data Book, Weber Organizational Book, a Service Manual, and special Presentation Folders containing valuable merchandising hints will be included in this material.

ADVERTISING

The most extensive advertising campaign in Weber history is now under way. Attention-getting, hard-selling ads in national and regional publications, descriptive literature, as well as co-operative dealer ads for local newspaper insertion, will call attention to Weber products, Weber quality, develop leads and prepare the way for the dealer to step in and do his selling job.

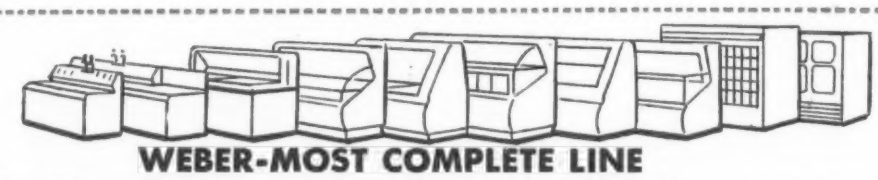
MARKET ANALYSIS

Each region will have continuous market analysis to keep its dealers ahead of competition as to current trends, market potentials and other factors important in helping them get their share of local business and in developing new outlets for Weber products.



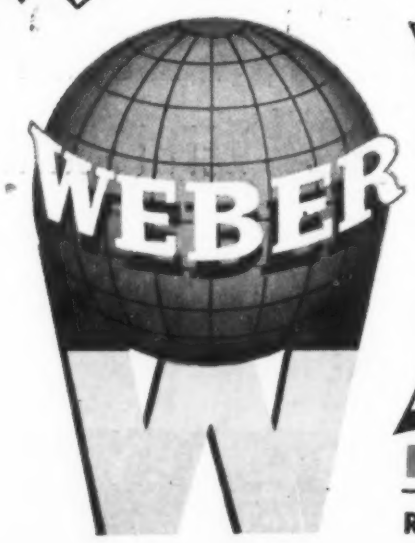
PRODUCT REFINEMENT

The entire Weber line of products is undergoing extensive re-engineering processes, and production methods are being improved to insure that everything possible will be done to uphold Weber Quality and keep the Weber name ahead of the field.



WEBER-MOST COMPLETE LINE

The Weber Dealer represents the *most complete* line of refrigerated equipment in the world. Whether soda fountains, ice cream cabinets, frosted food cases, meat cases or walk-in refrigerators, he beats competition by offering all required equipment to any retail place of business under one name, with one responsibility, from one organization.... the finest in the world.... WEBER.



the best news yet...

EXCLUSIVE DEALERSHIPS ARE AVAILABLE

If you are interested in discussing our Exclusive Weber Dealership, contact us immediately, today, if possible, so that an appointment can be arranged for you through our Regional Offices.

WEBER SHOWCASE & FIXTURE CO., INC.
5700 Avalon Boulevard • Los Angeles 54, California

FOOD GUARD REFRIGERATED EQUIPMENT

REGIONAL OFFICES AND WAREHOUSES IN PRINCIPAL CITIES

MORE THAN 100,000 NOW IN USE

Servel Supermetics gain wide acceptance with fixture manufacturers, dealers, distributors

Tooled and put in production after V-J Day, Servel's newest condensing unit—the Supermetic—has skyrocketed to a position of leadership in the cooling field. Now more than 100,000 of these completely modern condensing units are serving users in every phase of the refrigeration industry.

Efficient, dependable Supermetic units are the product of more than 25 years of experience and research in refrigeration. They are now being produced at capacity rate on a brand-new assembly line . . . in itself a triumph of modern engineering. As a result of their up-to-the-minute design and their quality-controlled manufacture, Supermetic condensing units have won tremendous acceptance in every state in the union.

- **Scores of America's outstanding fixture manufacturers have standardized on Servel Supermetics.**
- **Outstanding distributors and dealers in every major community sell Servel Supermetics.**
- **Many of America's largest chain food producers and distributors use Servel Supermetics.**

COME TO BOOTHS 429-31-33 AT THE ALL-INDUSTRY SHOW

Learn what happens "inside" the system by inspecting Servel's transparent Supermetic with a transparent evaporator. You'll be surprised!

See for yourself why Servel Supermetics have earned this overwhelming acceptance... why they constitute the most complete, yet the simplest and finest line of commercial condensing units in the industry.

In every field—every fixture—Supermetic leads in performance. ⬇

SUPERMETIC FITS... Low temperature units for ice cream and frozen food **(1, 11, 12)**. • Medium temperature units for fresh food fixtures, beverage and water coolers **(2, 4, 5, 6, 7, 10)**. • High temperature units for room coolers and store coolers **(8, 9)**. • Compressors for truck refrigeration and special applications **(3)**.

New Water Cooler Has Colored Plastic Top Plate

ARLINGTON, N. J.—An innovation in the design of electric water coolers has been effected by the Coolstream Corp. with the successful adaption of top plates of gaily colored plastic—Du Pont "Lucite" acrylic resin.

The top plates of Lucite, which comprise the entire bowl, are approximately 14 in. long by 18 in. wide and 2½ in. deep. They are available in a wide variety of colors to match or complement colors of the 41-in. cabinet, which has painted rolled steel sidewalls and a circular stainless steel front.

Designed in an elliptic shape with the rear side flat, the top posed difficult problems to the fabricator, the Steiner Mfg. Co. of Long Island City, N. Y. Steiner engineers finally solved the difficulties by deep-drawing the top plates, using reverse section and a male plunger simultaneously.

According to the manufacturer, the new tops have several advantages. The plastic, in addition to its beauty, is very light and resistant to abuse. It can be cleaned easily.

Once the original fabrication problems were solved, production became relatively simple and fast. The many colors available make it possible to harmonize the coolers with nearly any interior decoration motif.

The new tops are being manufactured in both the "bubble" type cooler and the bottle type in which the bottle is mounted directly through the plastic top into a steel holder.

As the result of tests, the manufacturer is guaranteeing the new type coolers for five years.

National Commercial Refrigerator Sales Assn. Banquet January 27 Will Feature 5 Speakers

CLEVELAND — Annual business meeting and banquet of the National Commercial Refrigerator Sales Association have been scheduled for the week of the show here, and will be held on Tuesday, Jan. 27, at the Carter Hotel.

The board of directors of the group, however, will meet the previous day, Monday, Jan. 26, at the Carter at 2 p.m. Tuesday's business meeting is likewise scheduled to begin at 2 p.m.

There will be five speakers at the annual banquet to be held at 7:30 p.m. Tuesday. They are John P. Butler, executive assistant to the mayor of Cleveland; E. M. Stultz, president, Viking Refrigerator Co.; George F. Taubeneck, editor and publisher AIR CONDITIONING & REFRIGERATION NEWS, and two officers of the association—George B. Herman, president, and A. J. Edmundson, secretary.

Members of the association may register in the lobby of the Carter, where they will also receive their badges for the All-Industry Show, announces R. H. Muehlberg, Jr., executive secretary.

This meeting, in a sense, is the first annual meeting of the association, which is slightly more than a year old. It was organized in Cleveland during the previous All-Industry Show held in November of 1946.

Buxton Gears Program To Market Reach-Ins, Cooler On Nation-Wide Basis

LOS ANGELES—Buxton, Inc., designer and manufacturer of commercial refrigerators, has decided to market its three new reach-in models and its new dry beverage and packaged food model on a nation-wide basis, Rowland Z. Lazar, secretary-treasurer of the organization, has announced.

These refrigerators are to be sold through distributors and dealers, Lazar declared. The firm's field sales manager, E. George Sanders, is located in Dayton, Ohio.

All three of the reach-in refrigerators feature two full doors and from 18 to 22-cu. ft. capacity in the size usually required for a 15-cu. ft. unit, according to Lazar. All models are streamlined and have a white finish inside and out.

One model, the 2-22N, is a normal temperature refrigerator with 22-cu. ft. capacity. It has a ¼-hp. hermetic compressor.

The model 2-20-C devotes half its 20 cu. ft. to normal refrigeration and half to 0° F. temperatures. It has a ⅓-hp. compressor.

The model 2-18-Z is an entirely low-temperature unit with 18-cu. ft. capacity.

The fourth unit in the Buxton line is called the Buxtonaire. Entirely new in design and engineering features, according to Lazar, it measures 4 ft. long, 28 in. wide, and 36 in. high.

It is powered by a ⅓-hp. compressor and features a concealed blower coil. It also has three front to back sliding doors.

At present, Lazar said, this refrigerator is being sold to bottlers with their brand name and advertising on it. He claims it is the only refrigerator of its type for bottled goods, cheese, dairy products, and candies.

He noted that Buxton intends to devote its entire facilities to the production of these items with the possible exception of making a few dry beverage coolers in 5-ft. and 8-ft. lengths.

Air Conditioning Aids Television Tube Output

BUFFALO — Air conditioning is playing an important part in the production of picture tubes for the rapidly growing television industry.

The Buffalo Tube Works of the General Electric Co., one of the largest producers of picture tubes in the country, finds that air conditioning is essential to efficient assembly of the intricate tubes.

In the base of the slender stem of the tube is mounted a mechanism called a cathode-ray gun. This shoots electrons to the "phosphor" coating on the face of the tube carrying the images. The "phosphor" coating is composed of powders that emit light when bombarded by the electrons.

Production of the tubes requires extremely close tolerances and dust-free operations. The assembly of the cathode-ray gun is particularly delicate, requiring an air conditioned room and precise fitting.

The "phosphor" coating on the faces of the tubes is installed in a department that gives the impression of a hospital laboratory. The room not only is air conditioned but is pressurized. Workers wear spotless white uniforms.

SEE THE *Hit of the Show*

PEERLESS!

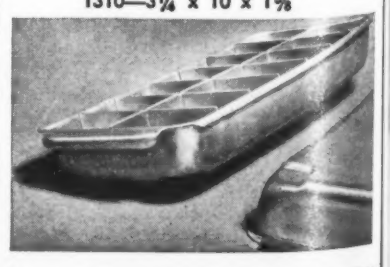
SPACE 707-709
CLEVELAND PUBLIC AUDITORIUM

January 26-29 1948

Under the PEERLESS colors of orange and black at the All-Industry Refrigeration and Air Conditioning Exposition, you'll again find the new products you desire. Peerless of America production is geared to give you equipment of the quality and the quantity YOUR market requires. Visit us at the PEERLESS booth. We want to see you because we are ready with products which will be the headline attractions of 1948!

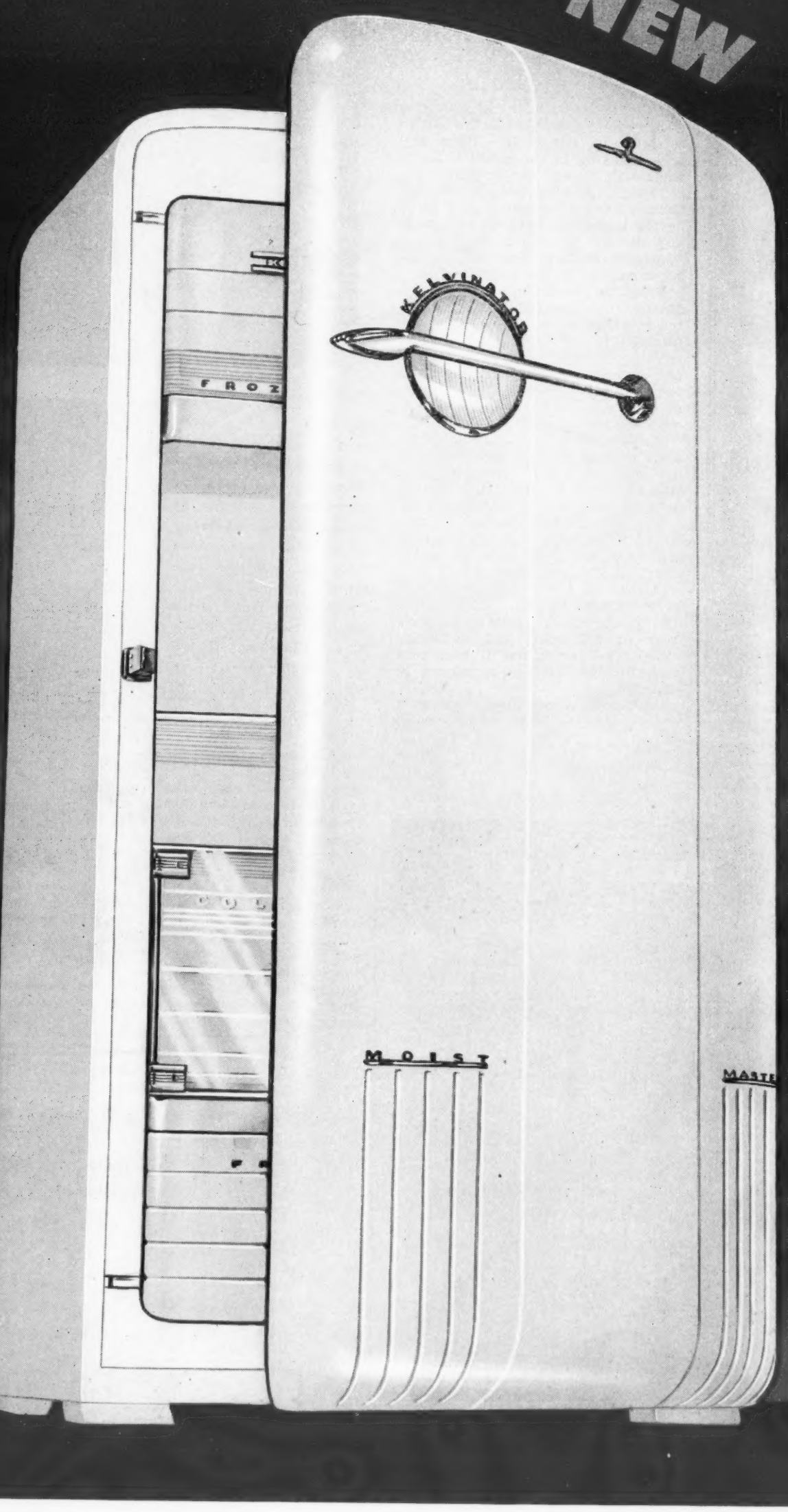
PEERLESS of AMERICA, Inc.
General Sales Offices
2901 LAWRENCE AVE., CHICAGO 25, ILLINOIS

NEW ALUMINUM ICE CUBE TRAYS IN 3 POPULAR SIZES.
Immediate Delivery
T46—4¾ x 6¾ x 1⅜
T411—4⅛ x 11⅛ x 1⅜
T310—3¼ x 10 x 1⅜



New replacement size, for Frigidaire, Kelvinator & G.E. 3¼ wide, 10 long 1⅜ high.

Manufactured By
EDISON COOLING CORP.
310 E. 149th St., New York 51, N. Y.



NEW
GIANT, 50-POUND FROZEN FOOD CHEST !

NEW
COLD-MIST ZONE THAT FRESHENS FOODS !

NEW
REFRIGERATED FROM TOP-TO-BOTTOM !

NEW
MOIST-COLD FRUIT FRESHENER !

NEW

Across the nation . . . Kelvinator men and Kelvinator retailers have been meeting . . . planning their future . . . cementing their bond of retail-mindedness . . . in an event they will remember for years. For they have just previewed a great achievement in Kelvinator's star-studded history . . . the new Kelvinator refrigerators for 1948!

Above you see the spearhead of a completely new idea in home refrigeration. So advanced in design, engineering and utility, it is destined to set a trend within the industry that will be followed for years to come.

Here is Kelvinator engineering leadership dynamically displayed!

To each and every individual Kelvinator retailer, securely confident of the future with his Kelvinator Franchise, these great new refrigerators faithfully express an established new-product policy: "When Kelvinator heralds a new line, the unusual may be rightly anticipated — revelations in styling, advanced utility, strong consumer appeal."

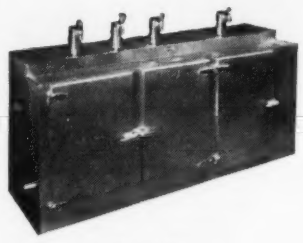
Kelvinator, Division of Nash-Kelvinator Corporation, Detroit, Mich.

Kelvinator — of Course !

THE MOST VALUABLE FRANCHISE IN THE APPLIANCE INDUSTRY

IT'S STERLING

For Stainless Steel Equipment



Direct-Draw
Made in 2 and 3 half barrel sizes

STANDARD EQUIPMENT

20 cu. ft. Combination Freezer-Medium Temperature Reach-In

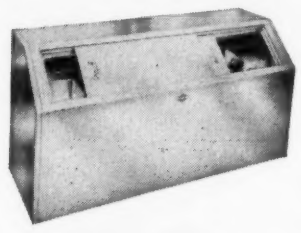
Walk-In Coolers

Direct-Draws

Beverage Coolers

COMBINATION FREEZER REACH-IN

4' x 24" x 5'6" high, Freezer compartment approximately 5 cu. ft., medium temperature compartment approximately 15 cu. ft. Stainless Steel interior, baked on enamel exterior.



Beverage Cooler
4', 6' and 8' Sizes

CUSTOM-BUILT STAINLESS STEEL EQUIPMENT

Designed to fit your particular requirements

Established 1904 STERLING ENGINEERING & MACHINERY CO., Inc.

STERLING ENGINEERING & MACHINERY CO., INC.

1012 Madison Street
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Refrigerated Self-Service Cases -|- Pre-Packaging = Sales Boom

Grocer Finds Fresh Produce Line Now Big Profit Maker

MINNEAPOLIS — Sales of fresh fruits and vegetables increased 220% in the Morningside neighborhood grocery here after installation of two refrigerated self-service cases and pre-packaging of the produce, David Budensiek, owner, has reported.

Though his store, located at 4386 France Ave., S., measures only 18 by 30 ft., Budensiek believes that he is now doing a greater fresh fruit and vegetable business than any of the supermarkets in his neighborhood.

Prior to installing two "Serv-Master" refrigerated cases, made by the Weber Showcase & Fixture Co., fresh fruits and vegetables were sold from an ordinary dry rack display, he related. The department was formerly a minor one from a sales standpoint. Now it is his profit-making line.

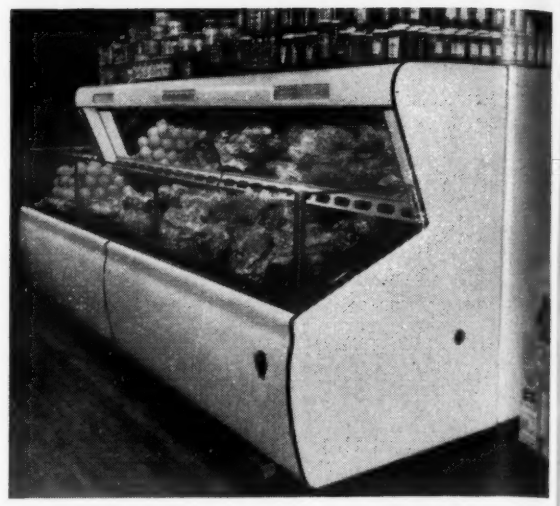
Shoppers are taking home 140% more produce "on impulse" than they did from the dry racks, he said. Besides, losses due to spoilage dropped from 12% to 0.58%.

When Budensiek decided to pre-package his fruits and vegetables, as well as display them under refrigeration, his sales mounted even higher and reached a level of 220% above previous figures.

Two experienced helpers are kept busy pre-packaging and restocking nine or 10 hours a day to keep pace with the increased sales volume, he declared.

Al Serpa, Weber district manager here, dropped into the store to get the reaction of customers to the refrigerated display and pre-packaging. They told him, he said, that they considered the fruits and vegetables they buy now more sanitary. They added that pre-packaging saves time in the kitchen.

"For a long time I had read and heard a good deal about self-service refrigerated display cases," Budensiek stated, "but it was not until I had installed the two Weber Serv-Masters that I realized all the good things I had heard were not exaggerated."



Above: Interior view of Morningside grocery in Minneapolis. Shown in upper center are the Weber refrigerated self-service cases that, with pre-packaging, jumped Owner Budensiek's fresh fruit and vegetable sales 220%. Right: Close up of the display cases.

Fort Wayne R.S.E.S. Elects A. A. Hughes, President

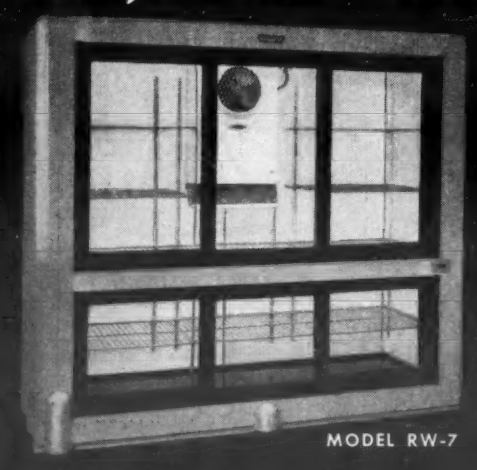
FORT WAYNE, Ind. — A. A. Hughes was elected president of the newly organized Fort Wayne chapter of the Refrigeration Service Engineers Society at its first meeting.

Other officers elected are Simeon Dettmer, vice president; P. E. Whitacre, secretary; Norman Engelbrecht, treasurer; Vernon Anderson, sergeant-at-arms; Walter V. Gildea, chairman of the educational committee.

DESIGNED FOR DURABILITY
NATIONAL LOCK
REFRIGERATOR HARDWARE
"THRU-THE-DOOR" LOCKING
• Commercial Refrigerator modernization is easy with "Thru-the-Door" Hardware. Ask us for application drawings. Standard items available for either plug type or full type door.
"EDGE-MOUNTED" HINGES
• The "Edge-Mounted" hinge is another answer to your modernization problem. Many years of field usage have proven its durability. Write for application drawings proving easy adaptation.
WRITE NOW FOR DESIGN PARTICULARS
REFRIGERATOR HARDWARE DIVISION
NATIONAL LOCK COMPANY
ROCKFORD • ILLINOIS

FOGEL
PHILADELPHIA, PA.

THE FOGEL "*Full-Vision*" WALL CASE



MODEL RW-7

IDEALLY SUITED FOR SELF-SERVICE

Showmanship in . . .

SELLING!

The Fogel "Full-Vision" Wall Case is a master showman for the display and sale of *dairy products, delicatessen, packaged fresh meats, fruits, vegetables, flowers, pharmaceuticals, and all perishables.* This beautifully designed, streamlined case features 99% visual display. *Visual display* that INCREASES SALES.

This rugged all-steel case has perfectly balanced Fogel refrigeration . . . guaranteeing years of trouble-free, worry-free, service. Why not order YOUR Fogel "Full-Vision" Wall Cases TODAY, and enjoy the profits resulting from the sales of the *one* case that's in a class by itself. Feel welcome to write for further information concerning this, or other, Fogel quality-engineered cases.

NOW AVAILABLE IN SEVERAL SIZES

•

One franchise gives you a complete commercial refrigeration line.

FOGEL REFRIGERATOR COMPANY
5400 EADOM STREET • PHILADELPHIA 37, PA.

Quality manufacturers, for almost one-half century, of Display Cases, Reach-Ins, Walk-Ins, and Freezers.

Accent on HOW

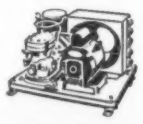
Better condensing units through

JACK & HEINTZ

Mass Precision

Electric Motors

Ball Bearings

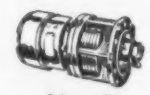


Refrigeration Compressors

Eisemann Magnetos

You'll enjoy the Jack & Heintz exhibit at the All Industry Show because its transparent, animated displays and cut-away models of J & H refrigeration equipment *tell you a lot quickly.*

Come and see how J & H precision-built units operate so smoothly and efficiently . . . why they have won such wide-spread acceptance.



Aircraft Starters

Aircraft Generators

Aircraft Inverters

JACK & HEINTZ PRECISION INDUSTRIES, INC., *Cleveland 1, Ohio*

Air Conditioning for Hospitals Must Get Under $1,000-a-Ton

CHICAGO—Because the majority of hospitals have difficulty in obtaining funds, the cost of air conditioning will have to be lowered to below $1,000 per ton of refrigeration if air conditioning is to find general application in this field, Gerald Dittman, of Schmitt, Garden, and Erikson, designers here, told the Chicago section of the A.S.R.E.

Dittman pointed out that air conditioning in hospitals and particularly for patients' rooms is only provided after other items are taken care of.

He noted that quite a number of hospitals in the Chicago area have obtained air conditioning for their operating and delivery rooms. In these cases, the systems are required to obtain 54% relative humidity with a maximum temperature of 80° F.

A five story hospital in Evansville, Ind., recently designed by his company, provided for air conditioning throughout, Dittman said. With a floor area of 21,000 sq. ft., the cost of both the heating and air conditioning was $104,200. The air conditioning system had a refrigerating capacity of approximately 110 tons.

Coleman New Chairman Of N. Y. Jobber Group

NEW YORK CITY—Phil Coleman of Coleman Electric Supply Co. has been elected chairman of the Metropolitan Refrigeration and Air Conditioning Jobbers Association of New York, Inc. to succeed Benjamin V. Blazer, Irving J. Fajans, secretary, has announced.

Ted Yeaces of Tesco Co. was elected to succeed Fajans.

Store Has 'Answer Girl'

MIAMI, Fla.—Burdine's of Miami has a special home economist employed now to answer questions regarding home freezers. She remains at the store two days a week and calls at homes on the other days.

REWA To Hear Representatives of Manufacturers and Contractors

CLEVELAND — Members of the Refrigeration Equipment Wholesalers Association will devote one full day of the show week to their thirteenth annual meeting, which will be held Tuesday, Jan. 27, in the Statler hotel here.

Morning and afternoon sessions are planned, these being closed meetings for members only. A luncheon has also been scheduled, and the day's activities will be capped with the annual banquet at 7 p.m. that night.

The meeting will be called to order at 9:30 a.m. with a roll call and introduction of new members, after which there will be reports from President G. J. Roche, Treasurer A. H. Holcombe, Jr., a presentation of the budget for the coming year, and reports on the Manufacturers Relations Committee by I. J. Fajans, chairman; and the Trade Relations Committee by J. P. Glass, chairman.

Three other talks are on the morning's program. F. K. Zimmerman of Lynch Mfg. Co. will discuss "Credit from Manufacturers' Point of View"; Warren W. Farr, president of the National Association of Refrigeration Contractors, will outline "N.A.R.C. Relations with Wholesalers," and H. R. McCombs, a director of R.E.W.A., will discuss "Wholesalers Will Need to Know the Facts In 1948."

Two discussions are planned for the afternoon session, which will get under way at 1:30 p.m. following the luncheon. F. V. Wilson's talk is entitled "Credit Problems Confronting Wholesalers In 1948," and T. I. Glou, immediate past president of R.E.W.A., is to give an address entitled "Wholesalers Must Set Up Merchandising Programs In 1948."

Open forum discussions, association business, and election of new directors will complete the afternoon session, immediately after which the new board of directors will meet and elect officers, who will be introduced at the banquet in the evening.

Master Program For All Events In Connection With the Show

MONDAY, JAN. 26

8 a.m.—R.E.W.A. registration. Hotel Statler.

9:30 a.m.—N.A.R.C. annual meeting. President's report, speakers. Allerton hotel.

10 a.m.—Preview of All-Industry Exposition (exclusively for wholesalers). Public Auditorium.

12:30 p.m.—N.A.R.C. press luncheon meeting. Allerton hotel.

2 p.m. — All-Industry Exposition (open to entire industry to 10 p.m.). Public Auditorium.

2 p.m.—N.C.R.S.A. board of directors meeting. Hotel Carter.

5 p.m.—Cocktail party given by R.E.M.A. for officers, directors, and secretaries of cooperating associations. Rose Room, Hotel Cleveland.

TUESDAY, JAN. 27

9:00 a.m.—R.E.W.A. annual meeting (first session). Hotel Statler.

9:00 a.m.—Drinking Water Cooler Manufacturers Association (division of R.E.M.A.) meeting.

9:30 a.m.—N.A.R.C. annual meeting. Allerton hotel.

9:30 a.m.—R.E.W.A. President's report, speakers. Hotel Statler.

12 noon—All-Industry Exposition (for refrigeration contractors, dealers, and service engineers only—open to 6 p.m.). Public Auditorium.

12:30 p.m.—R.E.W.A. luncheon. Hotel Statler.

12:30 p.m.—N.A.R.C. amendments to constitution and by-laws. Allerton hotel.

1:30 p.m.—R.E.W.A. annual meeting (second session). Hotel Statler.

2 p.m.—N.C.R.S.A. annual business meeting and election of officers. Hotel Carter.

7 p.m.—R.E.W.A. cocktail party and annual banquet. Hotel Statler.

7:30 p.m.—N.C.R.S.A. annual banquet. Grand Ball Room, Hotel Carter.

Evening—N.A.R.C. board of directors meeting. Allerton hotel.

WEDNESDAY, JAN. 28

10 a.m.—R.E.W.A. regional meetings. Hotel Statler.

12 noon—All-Industry Exposition (open to 6 p.m. to entire industry). Public Auditorium.

7:30 p.m.—All-Industry Exposition banquet (continuous entertainment to 1 a.m.). Arena Floor, Public Auditorium.

THURSDAY, JAN. 29

10 a.m.—All-Industry Exposition (open to 4 p.m. to entire industry). Public Auditorium.

5 p.m.—Meeting of All-Industry show committee and board of directors of R.E.M.A.

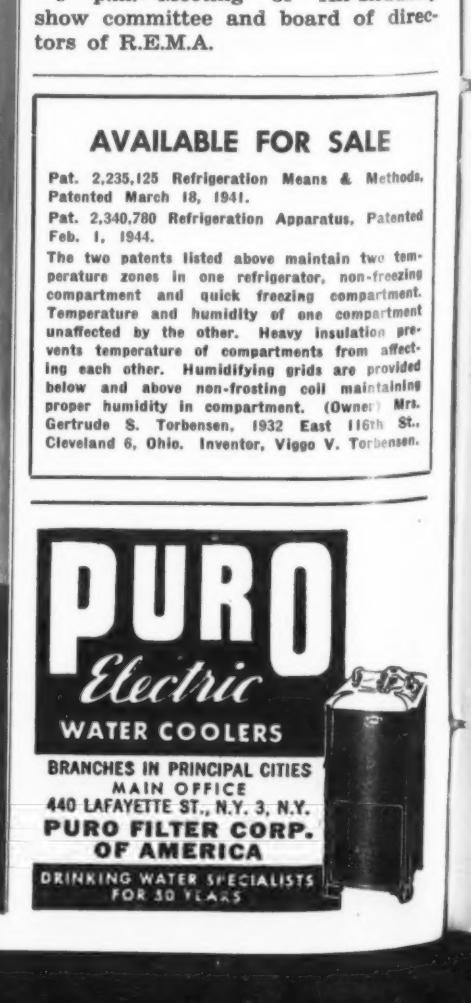
AVAILABLE FOR SALE

Pat. 2,235,125 Refrigeration Means & Methods, Patented March 18, 1941.

Pat. 2,340,780 Refrigeration Apparatus, Patented Feb. 1, 1944.

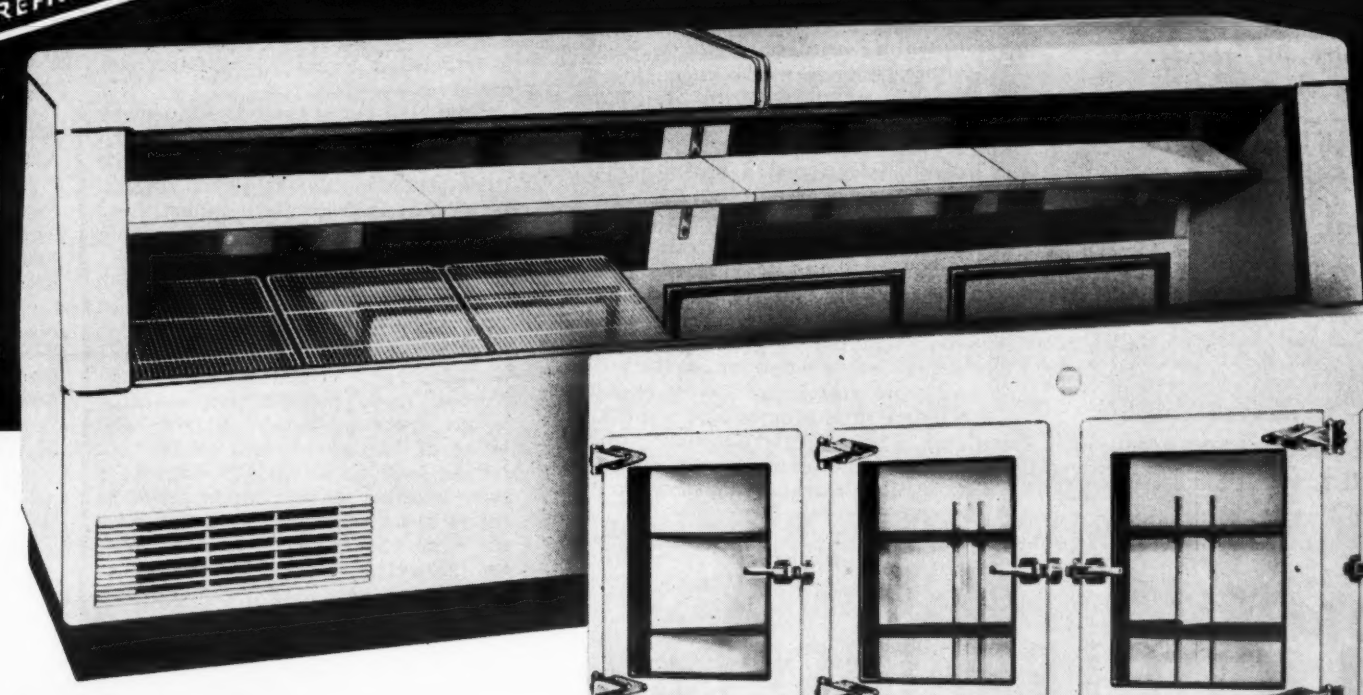
The two patents listed above maintain two temperature zones in one refrigerator, non-freezing compartment and quick freezing compartment. Temperature and humidity of one compartment unaffected by the other. Heavy insulation prevents temperature of compartments from affecting each other. Humidifying grids are provided below and above non-frosting coil maintaining proper humidity in compartment. (Owner) Mrs. Gertrude S. Torbensen, 1932 East 116th St., Cleveland 6, Ohio. Inventor, Viggo V. Torbensen.

Every Day is
"SHOW DAY"
For BLU-COLD Dealers
Everybody likes a good show—and no doubt we will all profit greatly from the many fine exhibits and meetings at this great convention in Cleveland.
But it's the other fifty-one weeks of the year that keep the cash register tinkling. In other words, the show that counts is the show-ing you can make in your own place of business every plain working day.
Lehigh BLU-COLD tries to make it possible for BLU-COLD dealers to have a "show-day" every day right on the job. In that respect BLU-COLD frankly stands on its record—with its own dealers, and with tens of thousands of BLU-COLD users.
Here's A Full House For '48
★ PACKAGED AIR COOLED
¼ H.P. ⅓ H.P.
★ MEDIUM DUTY AIR COOLED
⅓ H.P. ½ H.P. ¾ H.P.
★ HEAVY DUTY AIR COOLED
⅓ H.P. ½ H.P. ¾ H.P. 1 H.P. 1½ H.P. 2 H.P.
★ HEAVY DUTY WATER COOLED
¾ H.P. 1 H.P. 1½ H.P. 2 H.P. 3 H.P. 5 H.P.
See general catalog for complete specifications
Package Type ¼ H. P. ⅓ H. P.
Medium Duty Air Cooled ⅓ H. P. ½ H. P. ¾ H. P.
Heavy Duty Air Cooled ⅓ H. P. ½ H. P.
Heavy Duty Air Cooled ¾ H. P. 1 H. P.
Heavy Duty Air Cooled 1½ H. P. 2 H. P.
All-Purpose Heavy Duty Air and Water Cooled 1 H. P.
Heavy Duty Water Cooled ¾ H. P.
Heavy Duty Water Cooled 1 H. P.
Heavy Duty Water Cooled 1½ H. P. 2 H. P.
Heavy Duty Water Cooled 3 H. P. 5 H. P.
Lehigh BLU-COLD COMMERCIAL REFRIGERATION
Lehigh BLU-COLD
AMERICA'S MOST MODERN CONDENSING UNITS—AIR AND WATER COOLED
Lehigh Manufacturing Co. • Plant: Lancaster, Pa.



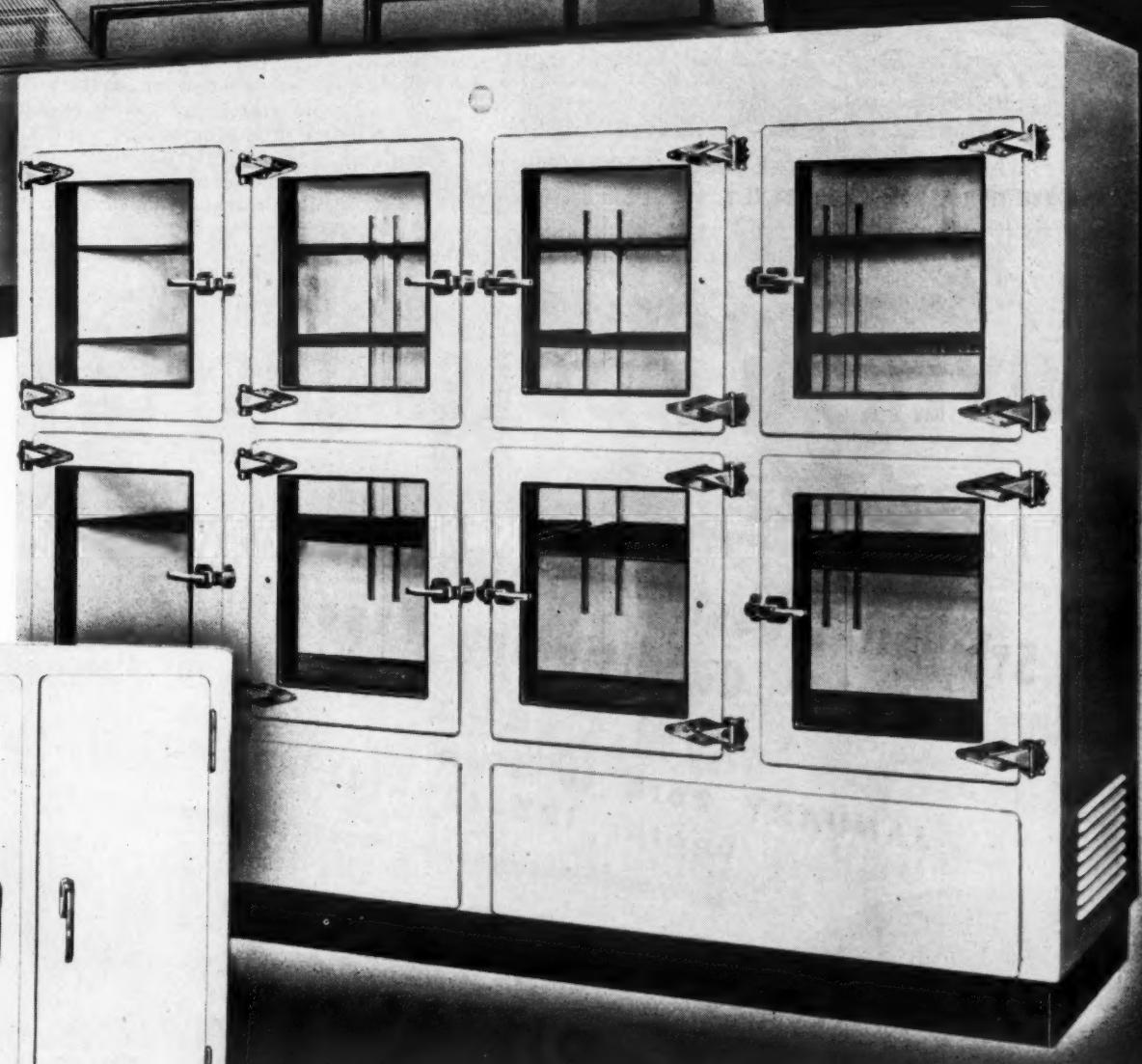
ANNOUNCING NATIONAL DISTRIBUTION of the Monterey line by WARD

WARD REFRIGERATOR & MFG. CO., LOS ANGELES, CAL.



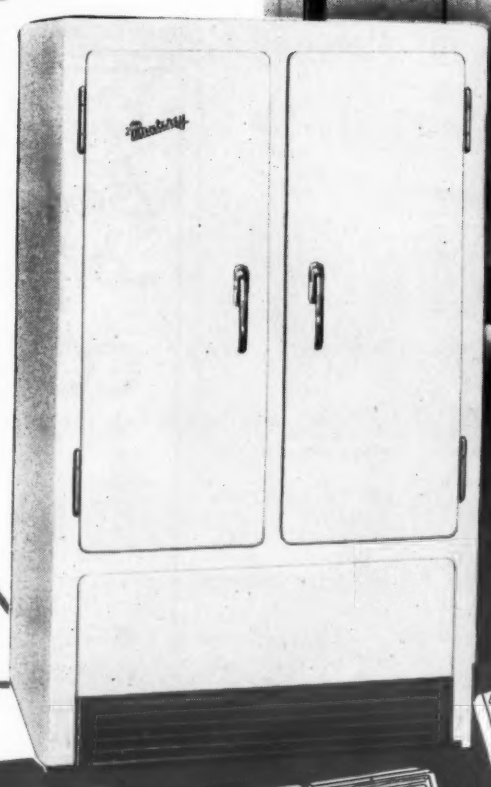
DD-11
Eleven-Foot
Display Case

GF 8-80-G
Eighty Cubic-Foot
Reach-in



COMMERCIAL REFRIGERATION at its Best

- Outstanding Features
- Unsurpassed Values
- Prompt Delivery

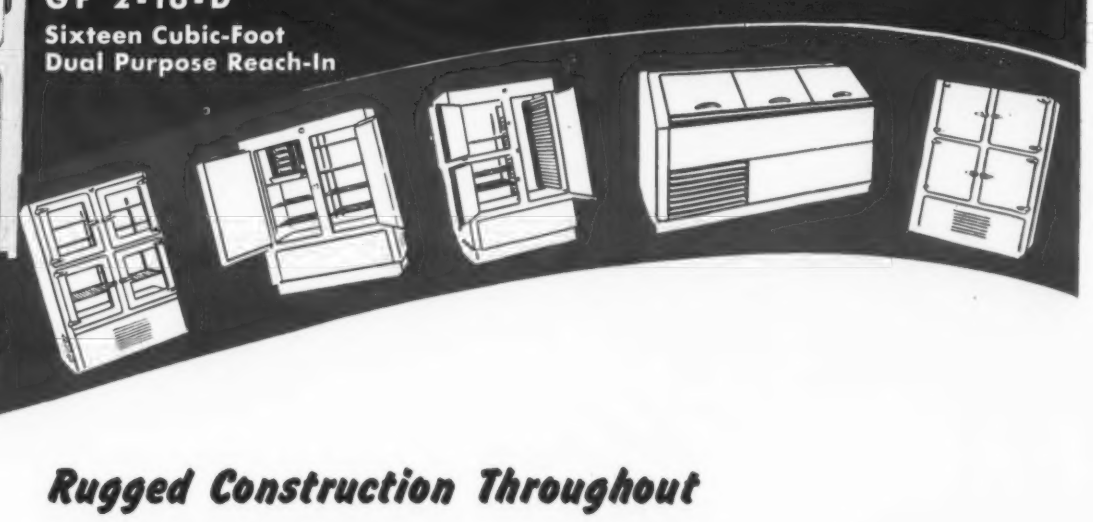


ADAPTED TO YOUR PARTICULAR NEEDS

Wide Choice of Door and Interior Arrangements

Available with blower coils, ice makers, glass or solid doors, and small or full length doors. Model GF-2-16-D has frozen food storage compartment.

GF 2-16-D
Sixteen Cubic-Foot
Dual Purpose Reach-In



Rugged Construction Throughout

PERFORMANCE AND EFFICIENCY PROVEN UNDER THE MOST EXTREME CONDITIONS

Ask us for the name of your nearest distributor

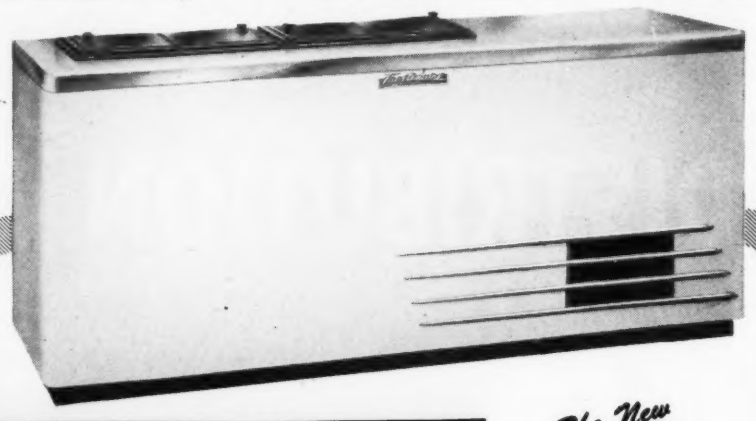
★**VISIT OUR DISPLAY**
at the Fifth All-Industry Refrigeration and Air Conditioning Exposition—
Booth Nos. 1121 and 1221

Allard

REFRIGERATOR & MFG. CO.

6501 South Alameda Street • Los Angeles 1, California • LAfayette 2136

A PACEMAKER FOR MANY YEARS! The Ward Organization Is One of the Pioneers in the Refrigeration Industry



Hole in Line
ICE CREAM CABINETS

The New Frostedaire

ALL STEEL CONSTRUCTION • WELDED THROUGHOUT
VAPOR-SEALED HULL • PULL-OUT UNIT
STREAMLINED BEAUTY

Monel "35" top; Rounded corners; Flip-Flop covers; Pull-Out unit, easier servicing; Wider and longer cover openings for ready accessibility, suitable Imperial Gallon.

NOTE CAPACITY ON IN-LINE CABINETS
ALL SPACE READILY ACCESSIBLE

2 Hole 10 Gal. • 3 Hole 15 Gal. • 4 Hole 20 Gal.

Manufactured by
Frostedaire CORP.
Division of WEST SIDE IRON WORKS
801 GREENWICH ST., NEW YORK 14, N.Y. • CHelsea 3-4900

New Market Opens In Cooling Use By Nurserymen

MONTEBELLO, Calif. — A strong possibility that florists, nurserymen, and seedsmen may in time take rank among major users of refrigeration and insulating equipment is seen in a new method developed by a large nursery here for retarding plant root growth by frozen refrigerated storage.

Adaptable to both wholesale and retail operations in this field, the method, if widely adopted, would open the doors of nearly 30,000 growers and handlers of flower and plants to the sellers of refrigerated storage equipment.

The pioneering work done here was carried out in the nursery of Howard & Smith, large wholesale operators with national distribution, which experimented with the cold-storage of rose plants. By putting the plants through a freezing process, it was found, root action could be completely arrested until the plants were ready for marketing.

Moreover, besides keeping the plants in a condition desired by the grower, low-temperature storage also benefits the ultimate purchaser, the nursery reports. When the rose slips and plants are kept cold, it is explained, the flow of sap is stopped and the starch content is equalized. The result is a more even growth and much faster development of the plants after planting or budding.

Similar storage of plants in retail establishments would be equally desirable, it is pointed out, since it would permit many plants and bulbs of hardy varieties to be kept for as long as 90 to 120 days in a fully inactive state. Stocks could be taken from storage as needed with the assurance that customers would be receiving plants or bulbs in prime condition.

Tests made with the rose plants at the Howard & Smith nursery showed that refrigerated stock set out 90 days after others set out in January in the normal manner enjoyed more rapid early growth. Comparison of growing rates of the two groups showed that by July 1 the refrigerated plants would be as large or larger than those handled in the conventional manner.

The nursery also discovered that the refrigerated plants would produce a more uniform and consequently more attractive, garden because the freezing process, by equalizing the flow of starch through the stem, contributes to a more even, regular development.

The low-temperature storage is expected to be especially valuable to large wholesalers who, because only a limited number of a specific plant can be handled within a short season under natural conditions, are now unable to serve a market corresponding in size to their growing potential.

NARC To Consider Proposed Code of Ethics, Hear Discussion on Unfair Trade Practices

CLEVELAND—Two morning sessions and a press luncheon make up the streamlined program for the annual meeting of the National Association of Refrigeration Contractors, which gets under way at 9:30 this morning, Jan. 26, in the Hotel Allerton.

President Warren W. Farr will open the program with a report of progress and highlights of the past year. The treasurer's report by A. M. Palen will follow.

George J. Roche, representing the Refrigeration Equipment Wholesalers Association, and George S. Jones, Jr., representing the Refrigeration Equipment Manufacturers Association, will then welcome the contractors.

After these talks, Dolph Jansen, account executive of Fuller & Smith & Ross, will close this session with an address on "Let's Thaw Out Some Refrigerated Facts About Merchandising.

Next will come the press luncheon, with George F. Taubeneck, editor and publisher of AIR CONDITIONING & REFRIGERATION NEWS, and Irving B. Hexter, of Refrigeration Industry, as the principal speakers, representing the entire press.

Others at the speakers' table will be Robert B. Powell of Southern Air Conditioning and Refrigeration Journal; H. S. Parish of Canadian Refrigeration Journal; Fred C. Kelly, Jr. of Refrigerating Engineer; and H. T. McDermott, of Refrigeration Service Engineer.

The press luncheon is open to all refrigeration contractors and their wives and guests.

Three talks, committee reports, election of six directors, and voting on amendments to the constitution and by-laws and the proposed code of ethics comprise the second session, starting at 9:30 a.m., Jan. 27.

Zed Jones, secretary-manager of the Refrigeration Contractors Association of Northern California, will give the first of the talks. He will speak on "Curbing Unfair Trade Practices."

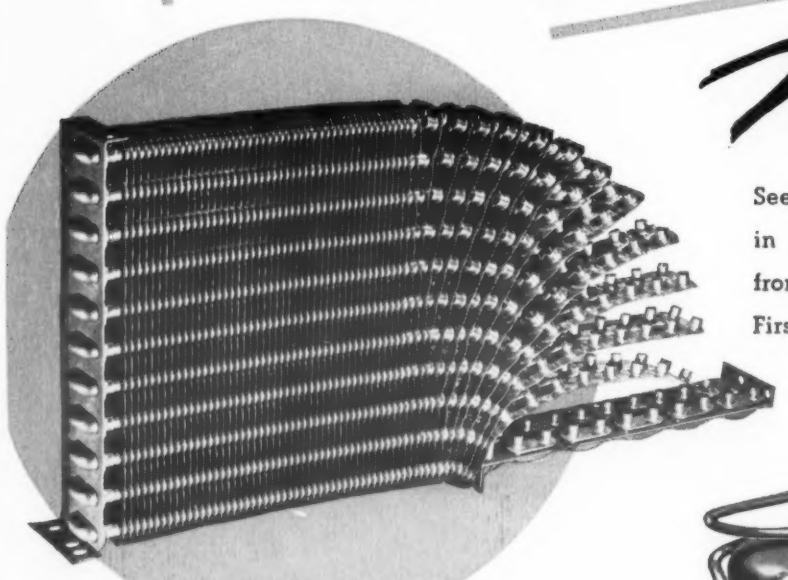
Arthur M. Carney, executive secretary of the Refrigeration Contractors Association of the State of Washington, will discuss "Establishing and Building Up a Local Association." "Off With the Old, Onward With the New" will be the topic of Ed Wright, first vice president of NARC.

Reports will then be heard from the trade relations, labor relations, legislative, membership, publicity, finance, and education committees. Election of directors and action on the revised constitution and the proposed code will wind up the program.

Dealer Hires Own Plumber When Others Won't Help

FT. WAYNE, Ind.—Frank's, handling Westinghouse major appliances, is making a point of announcing the use of the services of a plumber and electrician for installing water heaters without delay. The service is charged for.

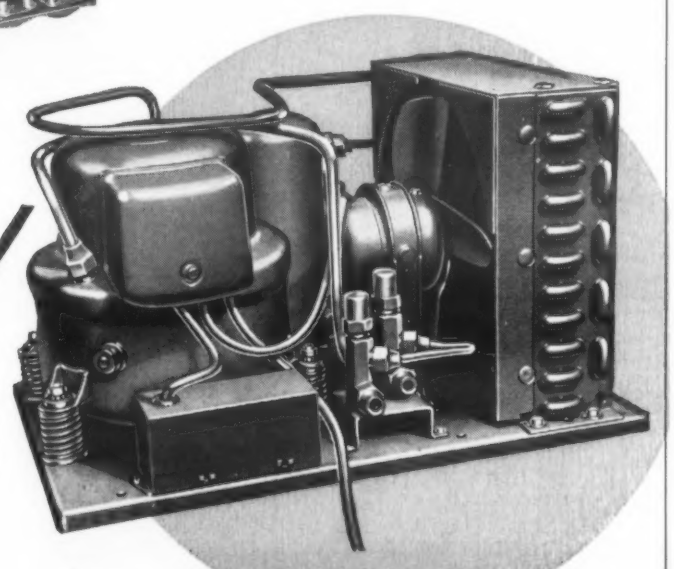
Save Plenty of Time for the
UNIVERSAL COOLER DISPLAY
at the
5th All-Industry Refrigeration and Air Conditioning Exposition
IN CLEVELAND
JANUARY 26th to 29th
Booths 127-129-131 and 133



New!

See Universal Cooler's new and better condenser in which the tube and fins are die-formed from a single sheet of copper-clad steel. First public showing at the All-Industry show.

New!



See samples of the new Hermetic units just added to the Universal Cooler line, broadening the range of U. C. D. Hermetic applications. First public showing at the All-Industry show.

UNIVERSAL COOLER
1922—1948 . . . 26 YEARS OF PROGRESS
DIVISION INTERNATIONAL DETROLA CORPORATION
MARION, OHIO • BRANTFORD, ONTARIO

A New Better Different

SEE US AT CLEVELAND BOOTH 125

COOLER CARBONATOR
SELF-CONTAINED FOR A VARIETY OF APPLICATIONS

● The famous Heat-X-Cast Aluminum Cooler now incorporates a carbonator . . . and like all other Heat-X equipment . . . is compact, simple, efficient and rugged. Result: a unit with many advantages for soda fountains, counter dispensers, vending machines and other applications.

HOW IT WORKS: Water entering the casting is cooled and then alternately with CO_2 gas enters the mixing chamber in the lucite carbonator head. Water and gas pass through atomizing orifice holes, and stainless steel wool permitting absorption of the gas. The carbonated water level in the bottom of the shell controls the water pump through a floatless relay.

Compact pump, motor and relay in one small unit.

THE HEAT-X-CHANGER CO., INC.
415 Lexington Avenue, New York 17, N.Y. Brewster, N.Y.

Welcome
MEMBERS OF:

Air Conditioning and Refrigeration Machinery Association, Inc.
American Institute of Refrigeration
American Society of Refrigerating Engineers
Commercial Refrigerator Manufacturers Association
Farm and Home Freezer Manufacturers Association
National Association of Practical Refrigerating Engineers
National Association of Refrigeration Contractors
National Commercial Refrigerator Sales Association
Refrigeration Equipment Manufacturers Association
Refrigeration Equipment Wholesalers Association
Refrigeration Service Engineers Society
Soda Fountain Manufacturers Association

—And Our Associates in The Refrigeration And Air Conditioning Industry—

To The 5th All-Industry Refrigeration And Air Conditioning Exposition
Cleveland Public Auditorium January 26-29, 1948

Visit Detroit Lubricator Company Booths No. 503 & 603

"DETROIT"

DIVISION OF AMERICAN RADIATOR & Standard Sanitary CORPORATION

DETROIT LUBRICATOR COMPANY

General Offices: 5900 TRUMBULL AVENUE, DETROIT 8, MICHIGAN

Canadian Representatives—RAILWAY AND ENGINEERING SPECIALTIES LIMITED, *MONTREAL, TORONTO, WINNIPEG*

"DETROIT" HEATING AND REFRIGERATION CONTROLS • ENGINE SAFETY CONTROLS FLOAT VALVES AND OIL BURNER ACCESSORIES • "DETROIT" EXPANSION VALVES AND REFRIGERATION ACCESSORIES • STATIONARY AND LOCOMOTIVE LUBRICATORS

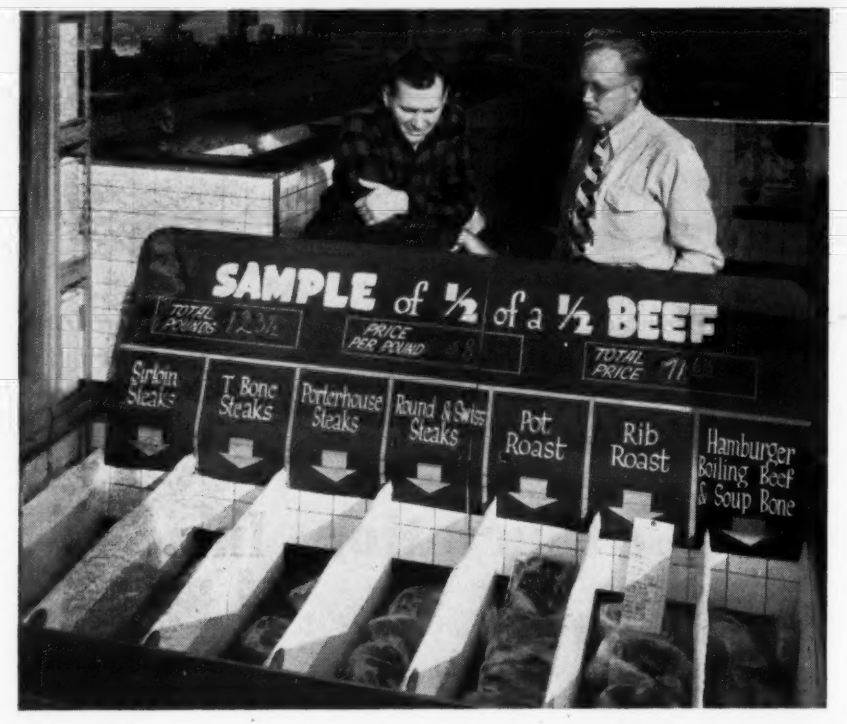
2930

"DETROIT"

Chicagoan Sells Appliances, Lockers, Frozen Food Under One Roof

* * *

'Half of a Half' of Frozen Beef In Show Window 'Dramatic' Promotion Ideas Bring '3-Way' Customers To Store



In full view of passersby, a display of "half of a half" of beef demonstrates the economy of buying meat in quantities and storing it in home freezers and lockers. Tony Van Eekeren (left), owner of the Roseland Locker and Appliance Store in Chicago, promoted the sale of a "half of a half" of beef with a home freezer with heavy newspaper advertising recently and sold 23 freezers in four days. Harold Johnson of the "Calumet Index" assisted in the advertising plans.

CHICAGO—By showing just how many cuts are available in a section of beef, and by offering the beef, a home freezer, and a three-month locker rental all in one "package," Tony Van Eekeren has customers flocking to his combination locker plant and appliance store.

Tony, who operates the Roseland Locker & Appliance store, 11567 Michigan Ave., has decisively exploded the myth that large scale sales of home freezers spell ruination for locker operators.

Recognizing that people think in terms of sirloin steaks, hamburgers, and prime rib roasts rather than hind-quarters or sides of beef, Tony decided to dramatize the economy of buying meat in large quantities and storing it in lockers and home freezers by describing just what cuts and how many were available in a "half of a half" of beef.

STEAKS IN A WINDOW

Using his acquired knowledge of refrigeration, Tony built an ingenious window display case where he could lay out a "half of a half" of beef in full view of passers-by. In this way, he is able to show just how many sirloin steaks, how many porter house steaks, and how many other cuts make up a "half of a half" of beef as well as how economical they are when purchased in quantity.

AN OFFER IS MADE

Slowly an effective sales message was worked out. It offered free locker rental for three months, free cutting, wrapping, freezing, labeling —all on an instalment basis. With headlines blaring "Down goes your meat bill, when you buy in quantities direct from us," full page advertisements were run in the community newspaper. Results were so prompt that the advertisements often paid for themselves within a day.

This promotion pepped up sales of locker units and moved a tremendous amount of beef. Tony recently checked into his sales of home freezers and discovered, however, that he hadn't made a sale in a month and a half.

With this in mind, he began to figure out a way to tie in freezers with his sale of meat and came up with a plan whereby a freezer, a "half of a half" of beef (cut and prepared), and three months free locker rental were offered on an instalment plan.

FULL-PAGE ADVERTISEMENT

Taking a full page of space in the *Chicago Sunday Tribune,* Tony laid his plan before a meat-hungry public. Response was immediate. He hold 23 freezers the first four days after the advertisement, and they're still going strong. Meat is moving more rapidly than ever. In addition, customers passing his self-service store are stopping by to pick up increased amounts of frozen food as well.

Tony discovered that those to whom he sells freezers become enthusiastic users of frozen foods. Sooner or later they return to rent supplementary locker space.

Besides spending upwards of 15 hours daily devising ways to keep the customers for his 6,000 lockers and large self-service frozen food store satisfied, Tony has found time to develop his advertising sales message himself.

An individual locker operator, Tony has hit upon a scheme which moves customers to buy freezers immediately although some manufacturers are worrying about sales resistance in this field.

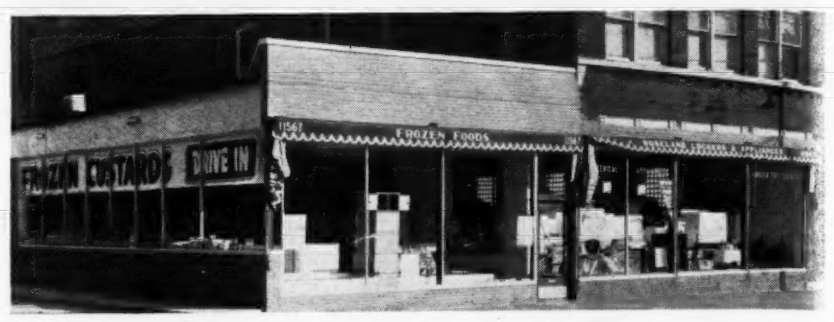
WAS MILKMAN 4 YEARS AGO

But then, Tony is a remarkable fellow. Only four years ago he was delivering milk on Chicago's South side, and had been for 17 years since coming from Holland.

Today, however, he is using full pages in several newspapers to tell customers of his latest values. In connection with the announcement of his newly opened self-service frozen food store adjacent to the locker plant, he gave away such merchan-

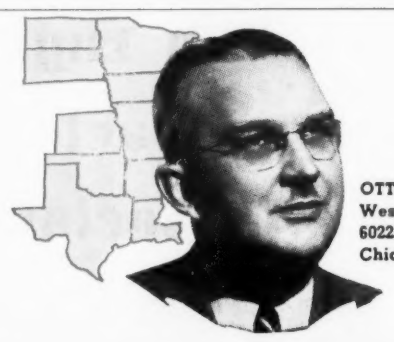
(Concluded on Page 16)

Offering Appliances, Frozen Food or Locker Space



An abandoned "ghost" structure not three years ago, this building is now the home of the Roseland Locker and Appliance Store, 11567 Michigan Ave., offering a full line of electrical appliances, "Chicago's largest selection of frozen foods," home freezers, and a locker plant with a capacity of 6,000 units.

E. B. BRADLEY
Pacific Coast and Mountain States
Los Angeles — 1205 S. Hill St.
San Francisco — 462 Bryant St.
Seattle — 2408 First Ave.
San Diego — 3669 California St.

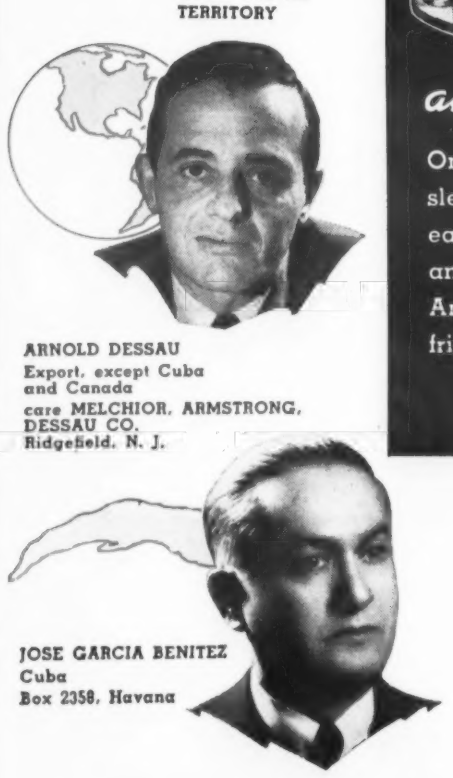


OTTO M. WENK
West Central
6022 N. Francisco St.
Chicago, Ill.

JOHN J. MADDEN
New England States
Box 86, Dedham, Mass.

HOME OFFICE TERRITORY

ARNOLD DESSAU
Export, except Cuba and Canada
care MELCHIOR, ARMSTRONG, DESSAU CO.
Ridgefield, N. J.



JOSE GARCIA BENITEZ
Cuba
Box 2358, Havana

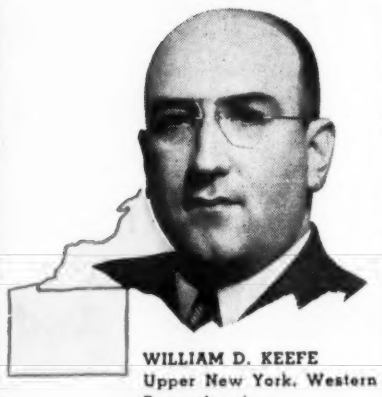
Leadership
in DESIGN
in ENGINEERING

and in SERVICE

One of these men is always within a sleeper jump or a five-hour plane trip . . . eager to share with you the know-how and the know-why that have developed America's finest line of commercial refrigerator hardware.

"WHEN THEY TRIP, THEY GRIP"

AUSTIN L. BROWN
Southeastern States
507 Kennesaw Ave.
Marietta, Ga.



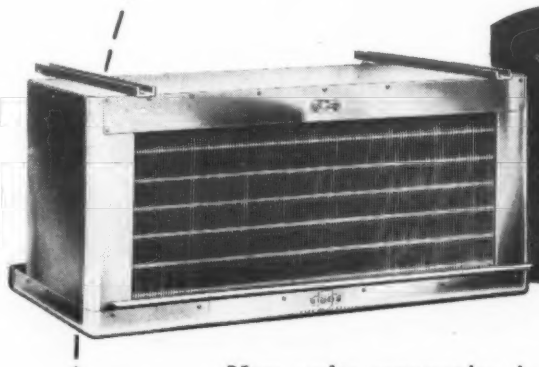
WILLIAM D. KEEFE
Upper New York, Western Pennsylvania
Chaffee, N. Y.

H. A. GUDEN
Metropolitan New York, New Jersey, Eastern Pennsylvania
87 Walker St.
New York 13

Grand Rapids Brass Company
Makers of Dependable Refrigerator Hardware for over 40 Years
Grand Rapids 1, Michigan

WORLD'S LARGEST REFRIGERATED WAREHOUSE
WILL BE "RECOLD" EQUIPPED

RECOLD PRODUCTS WERE CHOSEN BECAUSE THEY HAVE A DEPENDABLE RECORD OF PERFORMANCE



HERE'S THE FAMOUS "RECOLD" WATER DEFROST COIL SELECTED FOR THIS OUTSTANDING INSTALLATION.

Now under construction in Dallas, Texas, is Alford Refrigerated Warehouses, which, when completed will be the world's largest. "Recold" famous water defrost low temperature coils have been selected to supply all of the low-side refrigeration. 285 of these units will be supplied for this job. Another proof that "Recold" products are right. This coil along with other new and improved products will be on display at the All Industry Show in Cleveland. See them in Booth 914-A.

"RECOLD"
REFRIGERATION ENGINEERING, INC.
7250 East Slauson Ave., Los Angeles 22, Calif.

AGAIN---
the HITS of the SHOW

Hudson's Soft Drink Dispenser and Constant Pressure Carbonator are the greatest improvements ever invented for modernizing fountains and bars. That's why they are Star Performers wherever they're installed . . . the Hits of every show.

HUDSON SOFT DRINK DISPENSER

3 WAYS FOR BARS: Just imagine, a single dispensing unit for the three most popular chasers—soda, cola and gingerale, with every drink drawn ready mixed, perfectly proportioned with syrup and soda, ice cold, and ready to serve. And the bartender never has to open a bottle, throw away a bottle cap, or touch a piece of ice. Here's how it works. . . . Pull the lever forward for a plain soda that sparkles and fizzes with life. Pull the same lever to the left for a tangy cola, and to the right for a zippy gingerale. Three delicious chasers all from the same Dispenser, yet every drink is clean with positively no intermixing of flavors. The Hudson Soft Drink Dispenser is easily installed right in the service bar, and syrup tanks connected into the system at any convenient place.

4 WAYS FOR FOUNTAINS: The Hudson Soft Drink Dispenser is equipped with a chrome plated gooseneck extension that raises the Dispenser head to the proper height and angle for use at soda fountains. This one Dispenser serves two popular carbonated fountain drinks, plus soda at high and low pressures. (The hi-pressure jet for carbonating ice cream drinks.) To draw a complete drink, simply pull the lever forward—left—right, or press the lever backwards for the hi-pressure soda jet. The Hudson Dispenser is automatic closing, shuts off tight, and cannot drip nor leak—has no packing or washers to wear and replace. Saves valuable counter space by eliminating on-the-counter syrup dispensing cabinets, saves muss and fuss of icing. Saves money.

HUDSON CONSTANT PRESSURE CARBONATOR

With the Hudson Constant Pressure Carbonator, a steady flow of sparkling carbonated water is automatically delivered at constant pressure up to 125 pounds at the draft arm. Yet, there is no motor, no electricity, no pumps, gears or belts—no parts to wear or get out of order—no soda coils to clean and purge. Two reciprocating cylinders automatically alternate to deliver a steady flow of thoroughly mixed, ice cold and sparkling carbonated water—ready to serve. No peak load in bar or soda fountain can come too fast or too heavy for the Hudson Carbonator. It's guaranteed to deliver a minimum of 25 gallons per hour.

The Hudson Constant Pressure Carbonator is lightweight (17 pounds) small and compact (3¾ x 16¾ x 9¾). Installation is simple and quick. Place the unit in the sweet water bath, bottle cooler, or other cooling system. Make 3 connections (fresh water and gas inlets, carbonated water outlet) turn on the CO_2 gas, and the Hudson Constant Pressure Carbonator is ready to operate.

More than 10,000 Hudson Constant Pressure Carbonators are now in daily operation proving the many profitable advantages of motorless, constant pressure carbonation.

HUDSON PRODUCTS, CO. INC.
4400 ST. AUBIN AVE.
DETROIT, MICHIGAN

Sells Appliances, Frozen Foods, Lockers

(Concluded from Page 14)

dise as a $625 television set and made special discounts on nationally known makes of radios.

"All this," he explains, waving his hand proudly around his store, "began when I bought a house which I turned into a three-family flat. Then I ran into trouble because I didn't have money enough to buy three new refrigerators. So I purchased three used ones.

"Every month there were $10-$15 repair bills for the used refrigerators so I began to figure how I could save this money. The best way seemed to be to fix the refrigerators myself. When I took a three months course in welding and refrigeration engineering at a night school, that started it," he declares.

"After fixing my own refrigerators, I began to repair all the neighbors.' The first thing I knew I had so much business in my basement that I had to quit the dairy. Four years ago I rented a store and went into the appliance business, too. After a year business was so good that I bought this building. It was boarded up and abandoned—just a 'ghost."

Through hard work, the old building was transformed into a modern appliance store and small locker plant with 500 units. Tony now has 12 times that many lockers and sells a wide variety of appliances ranging from room air conditioners to electric ironers.

It's only common sense for a locker operator to merchandise home freezers, according to Tony. To begin with, an operator offers the home freezer owner a convenient, economical source of quantity supply for many foods. All the tricks of freezing, packaging, buying, and managing stocks of frozen food are the specialized knowledge of the locker operator. He is the logical person to supply this information to housewives. The more women know about frozen food, Tony says, the more they want it.

Educating the public concerning the proper use and advantages of frozen food is generally conceded to be the greatest means of realizing the great future of the frozen food industry, he claims.

Women who utilize home freezers find more and more uses for frozen foods. Eventually they employ their home storage plants as supplementary units and make locker space the main source of storage for large stocks of food purchased when prices are low.

Freezer and $25 In Foods Sells at $246

OMAHA, Neb.—The Brandeis Department store home appliance department has launched a home freezer sales promotion in which the Philco home unit and a $25 assortment of Swanson poultry and Birds Eye fruits and vegetables will be sold for $246.

The supply of frozen foods includes 54 packages and is given as a "bonus" with each freezer sale while the promotion is in effect. The department store will stress liberal credit terms with the deal.

It's 'Self-Service' In Frozen Food Section of Store

"Chicago's largest selection of frozen foods" is the claim made by the Roseland Locker and Appliance store. Owner Tony Van Eekeren finds handling of frozen foods and locker service very helpful in selling home freezers.

Nebraska Community May Get Locker Plant In Pre-Fabricated Form

PERU, Neb.—This town, which is Nebraska's only community of 500 or more population that does not have at least one freezer locker plant, is about to get one. E. L. Bush, representing a Des Moines Ia., freezer-locker firm, is considering the erection of one or two prefabricated units of 124 lockers each.

Last fall a committee of seven citizens, headed by Peter Holdorf and C. A. Huck, was named to stage a drive for a locker system, and the goal of 150 locker subscribers was attained.

YOU'LL SELL MORE FREEZERS WITH AN *Amana* FRANCHISE!

because **The Amana Line is Complete!**

Models—from 5 cubic foot capacity to big 123 cubic foot "Walk-In" Model—there's an Amana for every Home, Farm and Commercial use.

because **Amana Quality-Built Features Help You Sell Amana!**

Only Amana offers famous "Zero Wall" construction which provides 100% Freezing surface—and 17 other quality advantages to help you turn prospects into sales.

because **Amana Gives Your Customers Extra Protection!**

There's a 5-year free replacement warranty on sealed-in mechanism and 5-year insurance policy against food spoilage given with every Amana Model 50 and 110.

Build your Future on an Amana Dealer Franchise. Get the Quality-Built Amana Story Today and be in Business to Stay.

The REFRIGERATION DIVISION
The Amana Society
Amana, Iowa

Pioneer specialists in low temperature refrigeration with a century-old tradition of fine American craftsmanship

Hollywood goes Amana!

Smashing National Advertising! In color—In National Magazines from Coast to Coast, the greats of Motion Pictures will help you sell Amana Home Freezers! Joan Caulfield, Dorothy Lamour, Gary Cooper, William Bendix, Myrna Loy, Groucho Marx, Alan Ladd, Cecil B. DeMille.

For Full Dealer Franchise Information...

Wire, Phone or Mail COUPON Today!

REFRIGERATION DIVISION
Amana Society, Amana, Iowa

Send me full information and details on Amana Dealer Franchise.

Signed.....

Address.....

City.....State.....

FREEZER SENTRY

BUZZ-Z-Z
when the Freezer breaks down . . .

● Every owner of a home freezer needs this signaling device to insure quick warning of mechanical failures. Whether you sell freezers or not you can sell the Freezer Sentry. Every day more freezers, without any signaling device, are being delivered in your territory. You know the owners. They need the Freezer Sentry. Particularly important for a rural owner at a distance from service facilities.

Here Is Why You Should Sell the Freezer Sentry

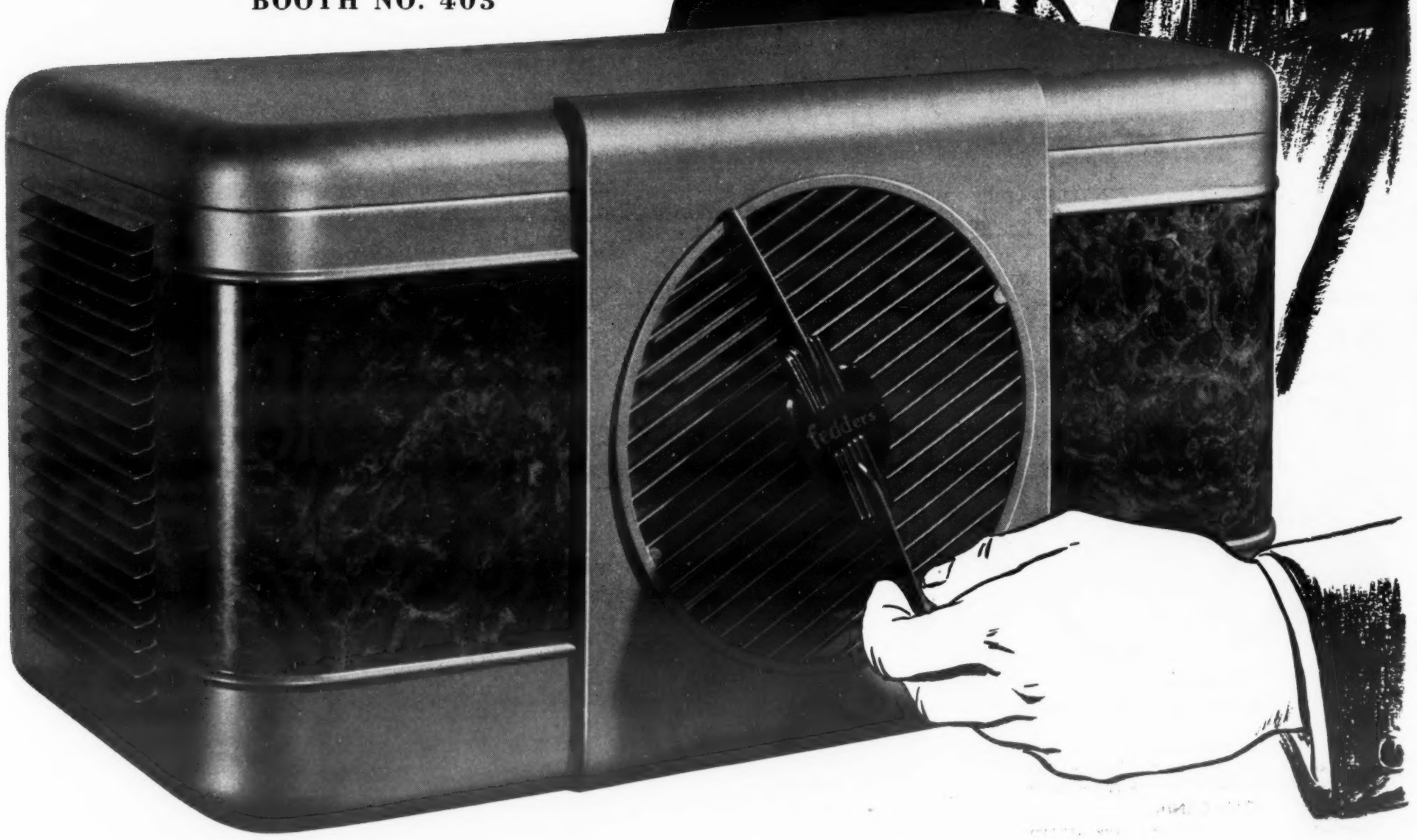
- **A package item. Installed by anyone in two minutes.**
- **Positive action. No thermostat to get out of order. A drop of mercury makes the contact.**
- **Battery operated. Trickle charger insures 5-year battery life and 100 hours buzzer operation.**
- **An extra good profit margin for you.**

Immediate delivery. Write today for descriptive material and price sheet.

JEWETT ASSOCIATES
1053 MAIN ST. BUFFALO 8, N. Y.

Meet me at the Cleveland Show

FEDDERS-QUIGAN
BOOTH NO. 403



See **FEDDERS NEW ROOM AIR CONDITIONERS**

They're Beautiful
They're Powerful
They're Quiet

It will be well worth your while to get a personal introduction to the new Fedders 1/2 ton and 3/4 ton Room Air Conditioners shown for the first time at the Cleveland Show. Equally as worth while will be your introduction to the Fedders program covering these big-selling, popular sizes . . . selected distributors and a complete cooperative program including sales and service training. Meet me at the Cleveland Show. January 26-29th.

E. A. Bonneville
SALES MANAGER
UNIT AIR CONDITIONER DIVISION

FEDDERS-QUIGAN
CORPORATION
BUFFALO 7, NEW YORK

Companies Displaying In the Greatest All-Industry Show

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Acme Industries, Inc. 604
Air Conditioning & Refrigeration News 507
Airserco Mfg. Co., Inc. 424
Alco Valve Co. 608
Aluminum Co. of America 918
American Brass Co. 217
American Flange & Mfg. Co., Inc. .. 1112
American Injector Co. 126
American Refrigerator & Machine, Inc. 711
The American Society of Refrigerating Engineers 1204
American Thermal Industries 1005A
Ansul Chemical Co. 713
Arcade Mfg. Div., Rockwell Mfg. Co. 1216
Armstrong Cork Co. 409
Automatic Products Co. 504
Baker Ice Machine Co., Inc. 506
Bally Case & Cooler Co. ....1105 & 1107
Baltimore Aircoil Co., Inc. 1212
Betz Corp. 609
R. H. Bishop Co. 112
Black, Sivalls & Bryson, Inc. 320
Bonney Forge & Tool Works 328
The Broquinda Corp. .....917 & 919
Brewer-Titchener Corp., Crandal-Stone Div. 1020
Brunner Mfg. Co. .....304, 306 & 308
Bundy Tubing Co. 407
Bush Mfg. Co. 610
Butcher Boy Cold Storage Door Co. 101
Century Electric Co. 909
Chicago Seal Co. .....323 & 325
Chrysler Corp., Airtemp Div. ..103 & 105
Cleveland Graphite Bronze Co. 921
Cleveland Refrigerator Co. 915
Colbar, Inc. .....108 & 110
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Coolstream Corp. 1006
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Day & Night Mfg. Co. 225
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Kold-Hold Mfg. Co. .....411 & 413
Kramer Trenton Co. .....116 & 118

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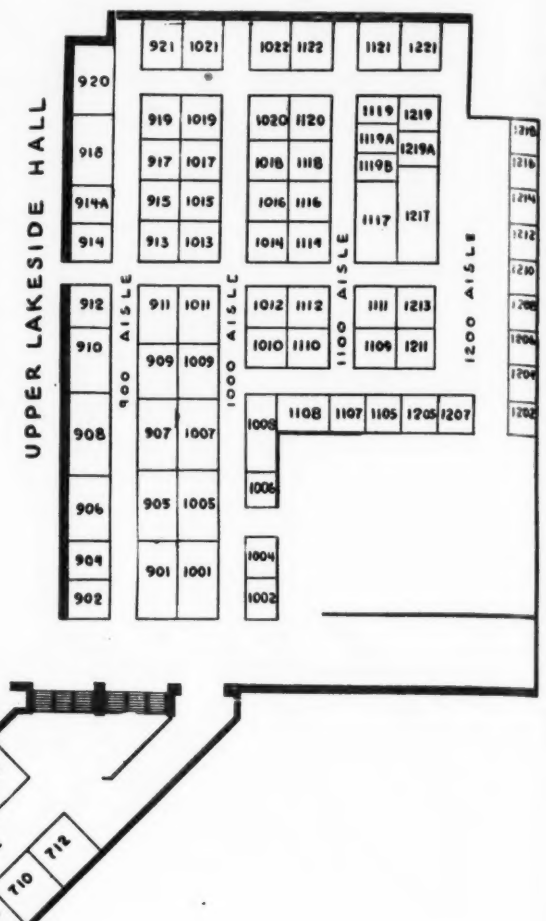
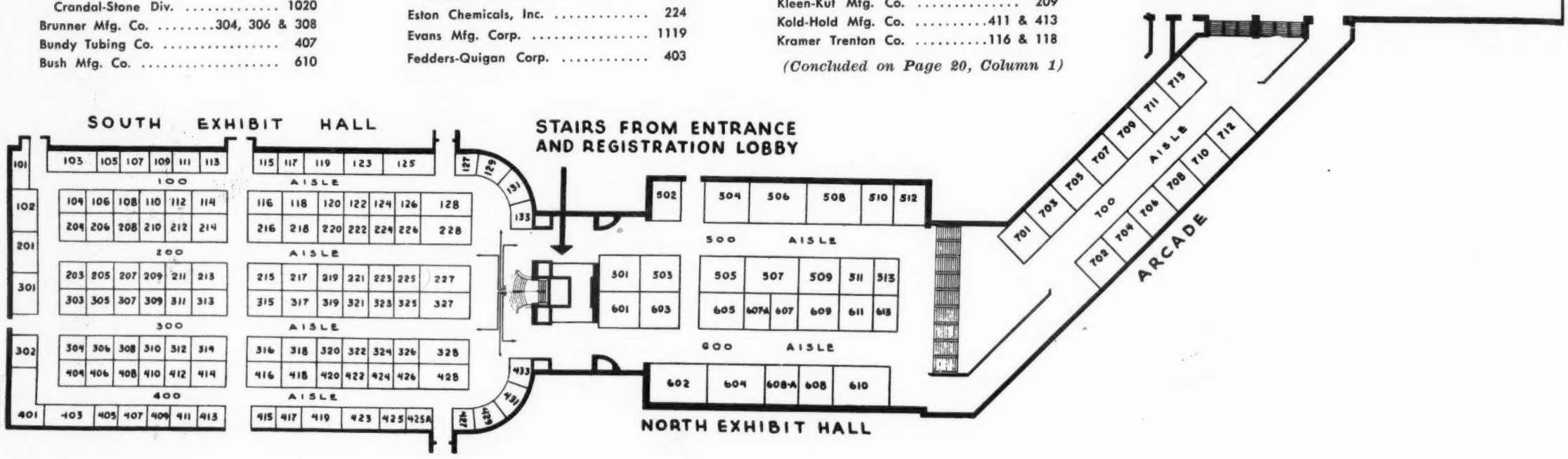
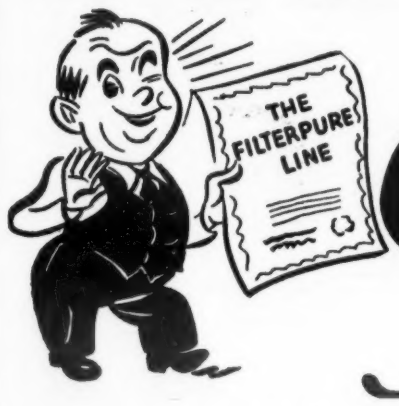




WE ARE JUSTLY PROUD OF OUR



Filterpure Wholesalers

FILTERPURE'S POPULARITY WITH THE TRADE, PLUS BETZ CORPORATION'S DISTRIBUTION POLICY HAS WON THE WHOLEHEARTED APPROVAL OF THESE LEADING WHOLESALERS FROM COAST TO COAST.

ALABAMA
Dothan.....Hand Radio & Refrigeration Company
Mobile.....Enochs Sales Company

ARKANSAS
Little Rock.....N. O. Nelson Company
Little Rock..Refrigeration & Electric Supply Company

CALIFORNIA
Sacramento.....Hinshaw Supply Company
San Francisco.....Hinshaw Supply Company

COLORADO
Denver....McCombs Refrigeration Supply Company
Pueblo....McCombs Refrigeration Supply Company
Pueblo.....N. O. Nelson Company

FLORIDA
Jacksonville.....Refrigeration Supply Corporation
Miami.....Ace Refrigeration Supplies
Miami.....Graves Refrigeration Company
Orlando.....G. W. Mann
Tampa..Graves Brothers Refrigeration Supplies, Inc.

GEORGIA
Atlanta.....Graves Refrigeration, Inc.

ILLINOIS
Chicago.....The Harry Alter Company
Chicago..Automatic Heating & Cooling Supply Co.
Chicago.....Chase Refrigeration Supply Company
Melrose Park.....Service Parts Company
Peoria.....Marquette Equipment Company
Peoria.....Polar Supply Company
Rockford.....Gustave A. Larson Company
Springfield....United States Electric Company, Inc.

INDIANA
Evansville.....F. H. Langsenkamp Company
Fort Wayne....F. H. Langsenkamp Company
Indianapolis....F. H. Langsenkamp Company
South Bend....F. H. Langsenkamp Company

IOWA
Davenport.....Gustave A. Larson Company
Des Moines.....White Refrigeration Supply
Dubuque.....Gustave A. Larson Company
Sioux City.....Dennis Refrigeration Supply

KANSAS
Wichita.....Refrigeration Equipment Company

KENTUCKY
Louisville.....F. H. Langsenkamp Company

LOUISIANA
Monroe...Humphries Refrigeration Supply Company
New Orleans....Acme Refrigeration Supplies, Inc.
New Orleans.....Enochs Sales Company

MICHIGAN
Detroit.....Lee Equipment Company
Flint.....Lifsey Distributing Company
Grand Rapids.....Harris Supply Company
Kalamazoo.....Harris Supply Company

MINNESOTA
Duluth.....Refrigeration Wholesalers, Inc.
Minneapolis...Refrigeration & Industrial Supply Co.
Saint Paul.....Refrigeration Supply Company, Inc.

MISSISSIPPI
Jackson.....N. O. Nelson Company
Jackson..Refrigeration & Air Conditioning Suppliers

MISSOURI
Cape Girardeau.....N. O. Nelson Company
Jefferson City.....N. O. Nelson Company
Joplin.....N. O. Nelson Company
Kansas City.....Refrigeration Equipment Company
Kansas City.....Superior Refrigeration Supply
Saint Louis.....N. O. Nelson Company

MONTANA
Billings.....Refrigeration Supply Company

NEBRASKA
Lincoln.....Wickham Supply Company
Omaha.....Dennis Refrigeration Supply

NEW YORK
Buffalo.....Jordan Supply Company
New York City.....The Harry Alter Company

NORTH DAKOTA
Fargo.....Refrigeration Supply Company

OHIO
Cincinnati.....Williams and Company, Inc.
Cleveland.....Williams and Company, Inc.
Columbus.....Williams and Company, Inc.
Dayton.....Allied Supply Company
Lima.....Allied Supply Company
Toledo.....Williams and Company, Inc.

OKLAHOMA
Oklahoma City..Macklanburg Supply Company, Inc.
Tulsa.....K and M Supply Company
Tulsa.....Palmer Supply Company

OREGON
Portland.....Peerless Pacific Company

PENNSYLVANIA
Pittsburgh.....Williams and Company, Inc.

SOUTH CAROLINA
Charleston....Roberts Refrigeration Supply Company

TENNESSEE
Memphis.....N. O. Nelson Company

TEXAS
Abilene.....C and H Distributing Company
Austin.....N. O. Nelson Company
Beaumont.....N. O. Nelson Company
Corpus Christi.....United Refrigeration Company
Dallas.....N. O. Nelson Company
El Paso.....Hays Electric Service
Fort Worth....Texas Refrigeration Supply Company
Houston.....N. O. Nelson Company
Lubbock.....Texas Refrigeration Supply Company
San Antonio.....United Refrigeration Company
Waco.....N. O. Nelson Company
Wichita Falls.....N. O. Nelson Company

UTAH
Salt Lake City.....N. O. Nelson Company

WASHINGTON
Seattle.....Peerless Pacific Company

WISCONSIN
Green Bay.....Gustave A. Larson Company
Kenosha.....Gustave A. Larson Company
Madison.....Automatic Temperature Supplies, Inc.
Madison.....Gustave A. Larson Company
Milwaukee.....Gustave A. Larson Company
Oshkosh.....Gustave A. Larson Company
Wausau.....Gustave A. Larson Company

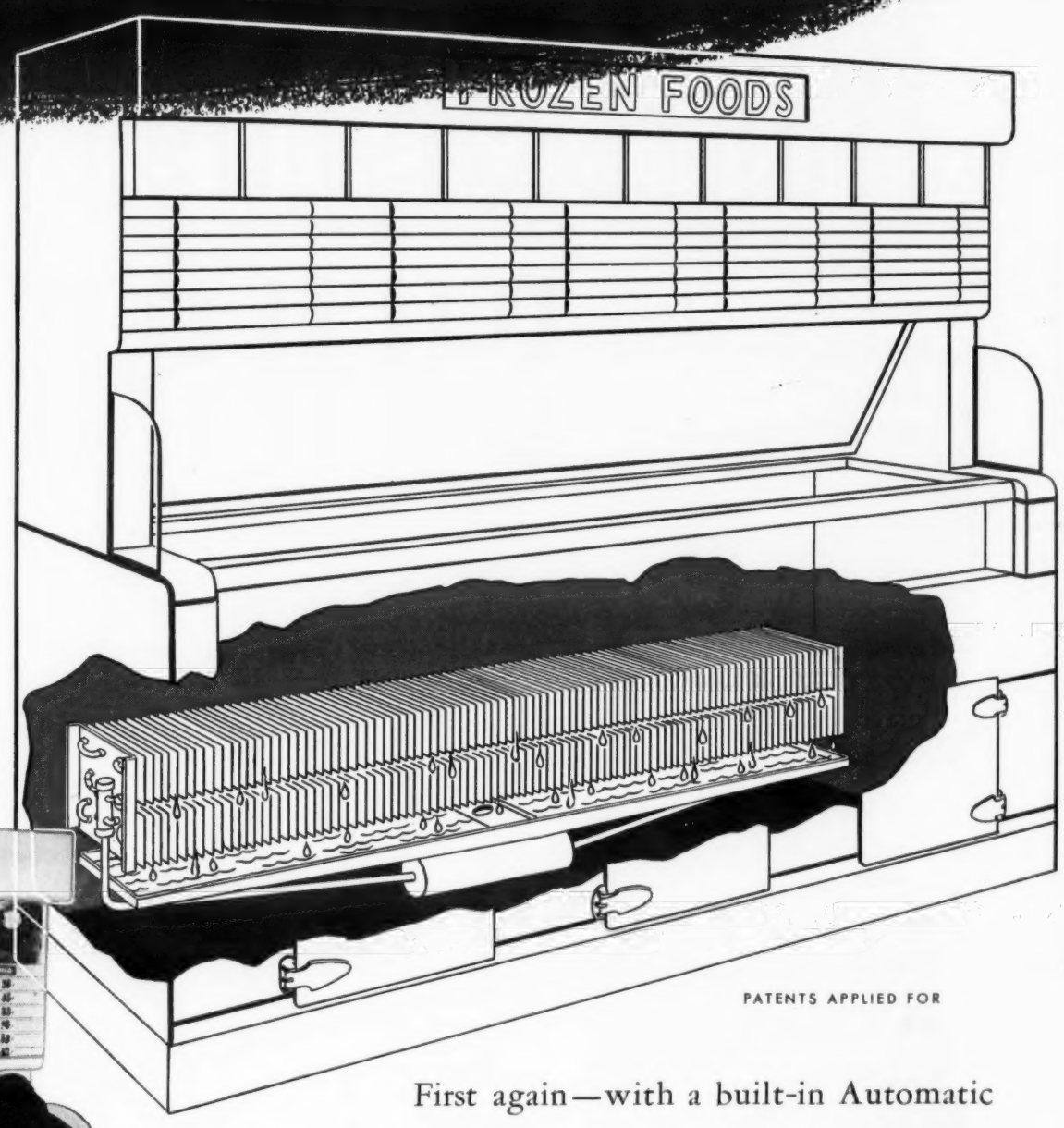
WATCH THIS LIST GROW

BETZ CORPORATION
HAMMOND, INDIANA

First* Again

TYLER BUILT-IN AUTOMATIC DEFROST SYSTEM

ON THE 1948 TYLER OPEN FROZEN FOODS DISPLAY CASE!



PATENTS APPLIED FOR

First again—with a built-in Automatic Defrost System on the 1948 version of the famous Tyler Frozen Foods Display Case—the open, self-service, mass-display case that revolutionized the merchandising of frozen foods back in 1945!

Tyler Automatic Defrosting will also be a feature of the 1948 Tyler Open Self-Service Meat and Dairy Case.

See this and other exclusive Tyler features at the All-Industry Show, Cleveland, January 26-29.—Booths 1002-1004.

1948 Tyler open, self-service, welded-steel FROZEN FOODS DISPLAY CASE. New Automatic Defrosting! New full-color food display cards! New flexible pricing system! New mass display of merchandise—with mirror and visible front!

R1

IT'S **TYLER**

FOR FOOD REFRIGERATION

*FAMOUS TYLER FIRSTS: *First* to use welded-steel construction in the commercial refrigerator field; *first* to employ modern, assembly-line methods; *first* with sectional, steel-clad Cooling Rooms; *first* with open, self-service Frozen Foods Display Cases; *first* to use multiple plants in the manufacture of commercial refrigerators; *first* with built-in Automatic Defrosting on open refrigerated display cases!

TYLER FIXTURE CORPORATION, NILES, MICHIGAN

All-Industry Show Exhibitors

(Concluded from Page 18)

La Crosse Cooler Co. 1110
Larkin Coils .....710 & 712
Lehigh Mfg. Co. .....226 & 228
Lewin-Mathes Co., Lewin Metals Div.. 1022
Liberty Motors & Engineering Corp... 1207
Linde Air Products Co. 1114
Lynch Mfg. Corp. .....102 & 201
McCord Corp. 107
McCray Refrigerator Co. 1213
McIntire Connector Co. 611
McQuay, Inc. 602
Marlo Coil Co. .....404, 406, 408 & 410
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Mayflower Products Co. 122
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Minneapolis-Honeywell Regulator Co. 701
Mitchell Mfg. Co. 1017
Mueller Brass Co. .....307 & 309
Nash-Kelvinator Corp. .....901 & 1001
Nat Corp. 1007
National Association of Refrigeration Contractors 1218
National Commercial Refrigerator Sales Assn. 1202
National Production & Sales, Inc..... 1005
Nevinger Mfg. Co., Inc. 913
Nickerson & Collins Co. .....104 & 106
Orley Freezers, Inc. 1210
The Pacific Lumber Co. 1208
Pacific Mfg. Corp. 1109
Paley Mfg. Corp. 910
Peerless of America, Inc. .....707 & 709
Penn Brass & Copper Co. 613
Penn Electric Switch Co. 1011
H. A. Phillips & Co. 912
Polar Hardware Co. 124
Prest-O-Matic Products Co., Inc. 405
Quillen Bros. Refrigerator Co. 1009
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Emery Thompson Machine & Supply Co. 1016
The Torrington Mfg. Co. 1108
Tube Manifold Corp. 1018
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Typhoon Air Conditioning Co., Inc... 907
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United Refrigerator Mfg. Co. ...511 & 513
Universal Cooler Div., International Detrola Corp. ....127, 129, 131 & 133
Victor Products Corp. 1012
Victory Metal Mfg. Corp. .....501 & 601
Virginia Smelting Co. .....204 & 206
Wabash Mfg. Co. 302
Wagner Electric Corp. 1118
Wagner Tool & Supply Corp..... 1119B
Ward Refrigerator & Mfg. Co. 1121 & 1221
The Weatherhead Co. 119
Weber Showcase & Fixture Co., Inc.. 1117
Westinghouse Electric Corp. 419
White-Rodgers Electric Co. ....211 & 213
Wilson Refrigeration, Inc., Div. of Wilson Cabinet Co. ....702, 704 & 706
Wolverine Tube Div. 505
The Yoder Co. 1014
York Corp. .....420 & 422

We offer intensive distribution in the New York Metropolitan Area.

We invite manufacturers of commercial refrigeration, air conditioning and allied equipment for stores and offices to communicate, at once, in confidence.

We enjoy an excellent wholesale and retail trade following.

We have thirty-five trained men in the field.

We buy for our own account.

Interested in quality products only, for our expanded 1948 sales program.

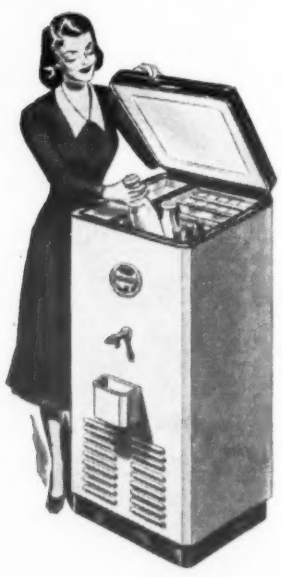
Box No. 2659, Air Conditioning & Refrigeration News.

You're stymied without SUNROC

EVERY DAY you put off investigating a Sunroc franchise costs you sales, costs you money. You're not set up to scratch the surface of the water cooler business in your community unless you're a Sunroc Distributor...armed with the finest and most diversified line of water coolers in America.

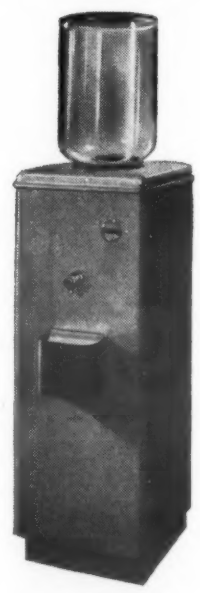
The Sunroc line for '48 blankets the business, industrial, and institutional markets . . . invades the vast home-market as well, with the sensational new Sunroc "all-purpose" Super Coolers. Comprehensive, hard-hitting advertising and promotion have softened up these markets in every nook and cranny in the nation.

You can take the measure of every water cooler prospect in your locality . . . sell him Sunrocs with the certainty of *immediate delivery*. Looks good for you as a Sunroc Distributor or Dealer? It *is* good . . . good enough to make you want to get that coupon off *today*.



SUNROC SUPER MODEL
Combination water cooler and refrigerator. Three ice-cube trays; ample refrigerated storage-space; unfailing source of properly chilled drinking water.

SUNROC WATER COOLER
Model NM2B—Pressure Type.
Capacity 10 gallons per hour.



SUNROC BOTTLE COOLER
Model US7B2
Capacity 3 gallons per hour.

★

Fourteen other great Sunroc models round out the only complete line of water coolers in America. Remember, without Sunroc you can't offer a *full* line of water coolers.

★

SUNROC
Water Coolers
GLEN RIDDLE, PA.
"SUNROC SERVES THE WORLD . . . a Cool Drink of Water"

When you visit the CLEVELAND SHOW be sure to see Sunroc's sensational line for '48—now on display at SUNROC COMPANY, 1300 W. 9th Street (2 blocks from the show)

SUNROC REFRIGERATION COMPANY
GLEN RIDDLE, PA.

Please send me, without obligation, complete information about the Sunroc line and Sunroc's personalized sales service for ☐ Dealers ☐ Distributors. (Check which.)

Company _____
Address _____
City _____ Zone ____ State _____
Address to Mr. _____ (AC-1)

New Drinking Water Program for Workers In Hot Atmospheres

PITTSBURGH—Steel mill workers and other employes operating under conditions of high temperature and oppressive humidity require almost twice as much drinking water as other workers, it has been disclosed in a survey conducted by the Drinking Water Cooler Manufacturers Association.

According to the survey the average steel mill worker, operating under temperatures of 120° F. and in air contaminated with carbon and sulphur fumes, must have nearly four glasses of water per hour. This is contrasted to the half a glass per hour required by the average person not doing laborious work and the slightly more than two glasses of water an hour needed by the average working man.

The association recommended 50° F. as the proper temperature for drinking water.

It has long been the practice of steel mills to furnish salt tablets at water coolers so that the saline losses of the body can be replaced. In this connection, Inland Steel developed a unique system for injecting salt into drinking water.

Salinized drinking water, circulating throughout their two Indiana Harbor plants near Chicago, reduced both the number and severity of heat sickness cases tremendously, according to results reported recently by Dr. Edward H. Carleton, director of Inland's medical department.

"Lost manpower due to heat sickness has dropped from as high as 288 man days in the years when only salt tablets were offered, down to less than 25 a year," the doctor stated.

Beginning with the first warm days of April or May, salt is added to the water which flows to the plants' 285 electric water coolers and other auxiliary drinking water sources serving some 14,500 workers.

"We have used mechanically refrigerated water coolers for many years, finding that they encouraged employes to drink more water which, of course, is very important," Dr. Carleton explained. "However, though salt tablets were made available in handy dispensers, we discovered that employes were not taking as much salt as they should in hot weather.

"In 1940, when tablets merely were available to workers, we had 144 cases of heat sickness. Several were severe and the average amount of time from work lost on all cases probably was two days.

"In 1941 we installed a salinizer in one of our plants, and as far as we know Inland's system for injecting salt into the water main was the first of its kind. It very possibly is the only plant-wide circulating system of its kind in operation even today," he said.

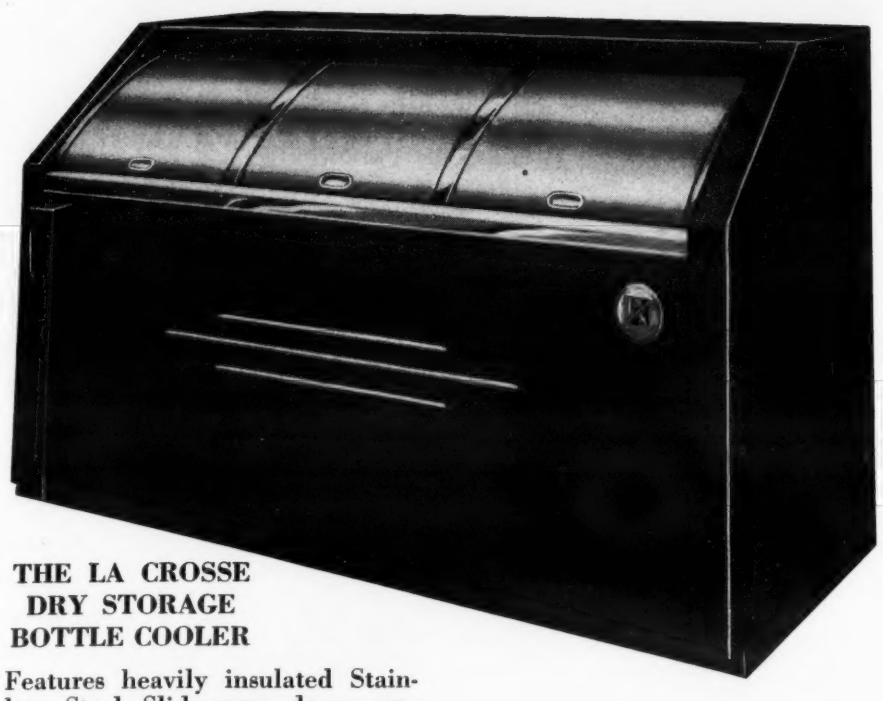
"A salinizer was installed in the second plant in 1943, and that year the number of heat sickness cases dropped to 61. In 1945 it was 19, 1946 48, and 1947 33. We now have no severe cases of heat sickness and the time lost per case averages four hours or less."

The salinizer, developed by Inland, injects a salt brine into the water main much in the same manner as chlorine is injected. They strive to maintain a .09% concentration of salt. This is approximately the same salt concentration found in human blood and tissue. When the drinking water is cooled, the salt taste is not discernible.

The brine is made from rock crystal salt. In 1947 Inland used approximately 100 tons of salt in its two salinizers.

DON'T OVERLOOK LA CROSSE IN YOUR '48 PLANS

You don't have to "shop around" in '48, the complete line of commercial refrigeration units offered by the La Crosse Cooler Co. will fill and satisfy all requirements. For quality in construction—dependability in performance—economy in purchase, the entire line of La Crosse commercial refrigeration units meets and beats all competition. Each model is built on a foundation of engineering skill—field research—and a complete understanding of refrigeration problems.

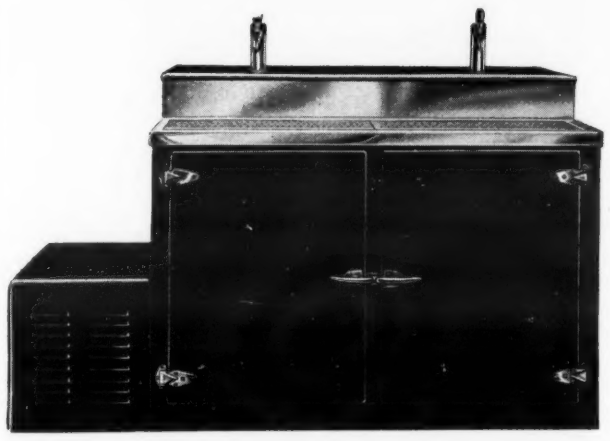


THE LA CROSSE DRY STORAGE BOTTLE COOLER

Features heavily insulated Stainless Steel Slide-away doors—unusually large capacity. The maximum in refrigeration efficiency.

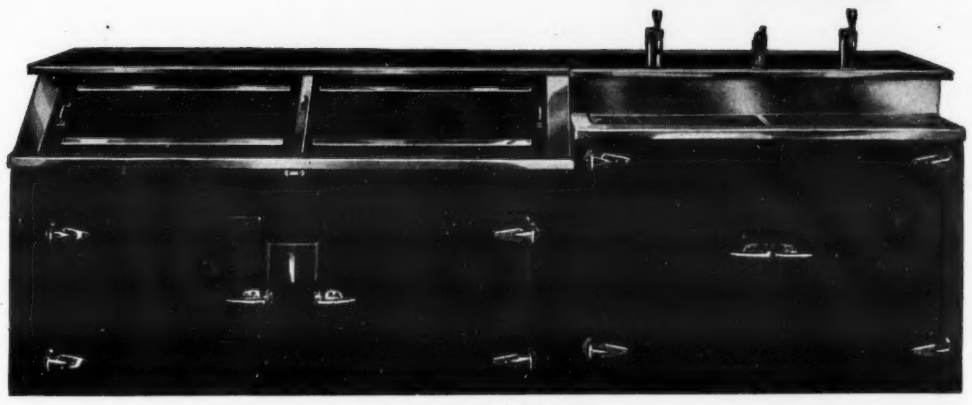
SUPREME SELF CONTAINED BEVERAGE COOLER

Available in 4′ and 6′ sizes.



THE LA CROSSE ELECTRIC DIRECT DRAW

Quality equipment used throughout guarantees the best in serviceability. Also available in 3 keg model and with 3 compartments—one of which is equipped with adjustable shelves for bottle storage.

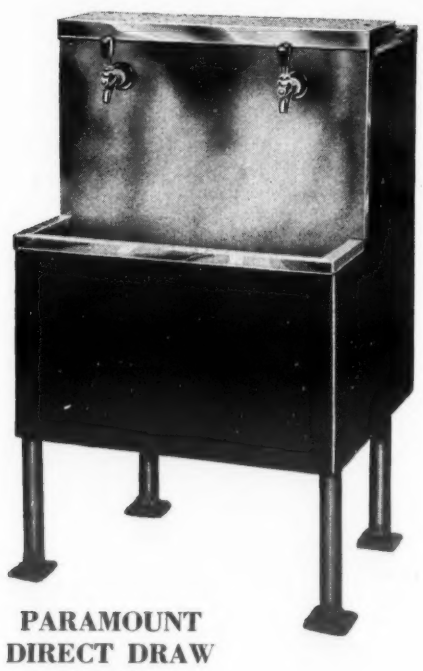


THE CLUB SPECIAL

The one piece combination 2 keg direct draw, two ½ barrel pre-cooler and dry storage bottle cooler.

ESKIMO ICE CUBE MAKER

Available with quick release style trays.



PARAMOUNT DIRECT DRAW TAP BOX

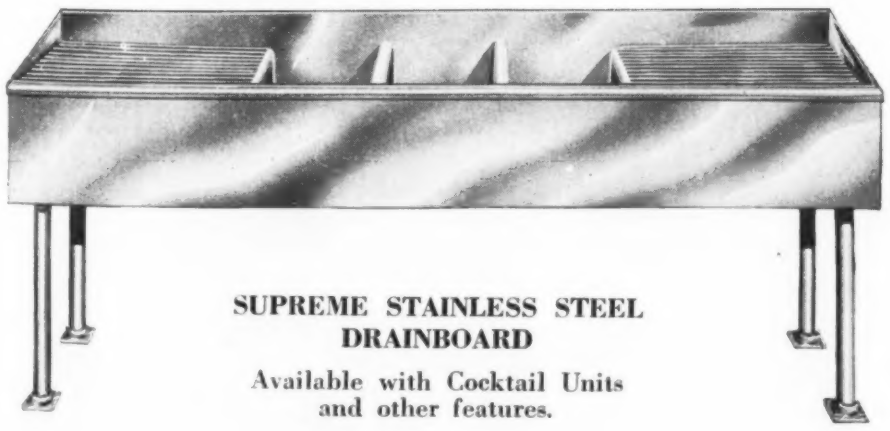
Available in various sizes.

LA CROSSE ICE CUBE MAKER

Capacity 21 trays plus Approximately 900 cube storage.

THE ECONOMY PRE-COOLER

The finest in storage equipment—serviceable, accessible and durable. Capacity for three ½ barrels below—16 cases of bottles above.



SUPREME STAINLESS STEEL DRAINBOARD

Available with Cocktail Units and other features.

For further information about these and many other models—Write to

LA CROSSE COOLER CO.

2809 LOSEY BLVD. SO. LA CROSSE, WISCONSIN

MELVIN PINE & COMPANY, INC., Export Managers
80 Broad St., New York 4, New York
Cable Address: EXIMPORT

Great Variety of New Products Make Bow at All-Industry Show

CLEVELAND—New and improved air conditioning and refrigeration products galore are awaiting the visitor to the All-Industry Exposition being held here this week.

Some 173 exhibitors are taking up 228 booths to display their latest models in everything from gaskets to a 43-cu. ft. reach-in refrigerator. Many of the exhibitors are simply showing off their products, distributing literature, and keeping competent men on hand to answer any and all questions.

But others are featuring operating models or cutaway demonstrators to give those interested the inside story on their products. A few are maintaining educational exhibits to outline manufacturing or testing processes.

Virginia Smelting Co. has the noted artist and caricaturist Pete Boyle on hand to entertain guests. He shares the spotlight with the company's "new and unique" leak detector.

Typical of those booths offering process exhibits are Bundy Tubing and Sun Oil Co. booths. Bundy has a showcase full of slides that pictorialize the manufacture of Bundyweld tubing. Sun has set up a photographic explanation of how flow tests are conducted on Suniso refrigeration oils to determine waxing tendencies.

Frigidaire is dramatizing its new Meter-Miser for commercial units by hooking one up to a cooling coil so that it forms a frost ball. A huge animated replica of the Meter-Miser stands nearby.

EVAPORATOR IN 3 SYSTEMS

Jack & Heintz is presenting visual demonstrations of evaporator action as operated by open-type and hermetic condensing units using the full-flooded, semi-flooded, and dry expansion systems.

In the South Exhibit Hall, Remco, Inc. has a refrigeration unit set up showing drier-filters installed in the liquid line, in the low side between the refrigerant control and evaporator, in the by-pass between the liquid and suction lines, and in the suction line.

For those visitors who want to give their eyes a rest and at the same time get a load of troubles off their chest, Kinetic Chemicals division of Du Pont and the McIntire Connector Co. are staffing their booths with men skilled at sympathetic listening and pulling correct answers out of a hat.

TO ANSWER 'FREON' QUESTIONS

The Kinetic representatives say they are prepared to answer all questions on "Freon" and the "Freon" situation. The McIntire men are keenly interested in moisture problems servicemen run into and stand ready to offer their solutions or assistance.

Some manufacturers have brought new products to the show that they consider to be particularly unusual.

NEW HEAT PUMP READY

For instance, the General Engineering & Mfg. Co. is displaying its Miracula heat pump for the first time. Two units are set up—one for cooling and the other for heating.

Ideal Cooler Corp. has set up its 8 ft. giant "army style" blower-type dry beverage cooler originally designed for army PX's during the war.

Lynch Mfg. Corp. is showing four Par heavy duty condensing unit models restyled for installation in tight quarters.

Ebco Mfg. Co. has on hand what it claims to be the only water cooled water cooler. Its booths also feature special glass panel cutaway demonstrators and operating water coolers for the thirsty.

DISPLAY CASE ON WHEELS

Refrigeration Corp. of America is showing off its "Wheel It Where You Want It" spot special frozen food cabinet and its frozen food display cases with three dimensional pictures.

Refrigeration Engineering, Inc. offers a peek at its new "Recold" evaporative condenser.

In one of the four Universal Cooler division booths the company's condenser with tube and fins die formed from a single sheet of copper clad steel is getting its first public showing.

This is not intended to be a comprehensive preview of the exhibits at the All-Industry Show (which was given in the Dec. 15 issue for all companies replying to requests for information on their exhibits) but rather a brief sketching of some of the new items that were promised or of some of the display ideas that would seem to be outstanding.

Full coverage on what was shown at the All-Industry Exposition will appear in post-show issues of the News.

For those interested in the latest in refrigerated transport, the Broquinda Corp. (space 917-19) is giving the first showing of its completely automatic low temperature transport refrigeration system controlling primary refrigerant at any temperature desired.

The show visitor with a sense of curiosity will want to hunt up the booths of manufacturers that have kept their displays a secret right up until showtime. A few such companies are Peerless of America, Inc. and Superior Valve & Fittings Co.

CONTROLS FOR NEW METHODS

Among the control manufacturers there are Penn Electric Switch's pressure and temperature controls which are claimed to be the first in the refrigeration field incorporating load carrying two pole construction . . . and White-Rodgers design change which permits the use of its controls with two circuit hook-ups.

Kold-Hold, in booth 411-13, is showing a streamlined truck plate, a serpentine plate stand, and a locker

(Concluded on Page 24, Column 3)

We'll see you "at the Show"...

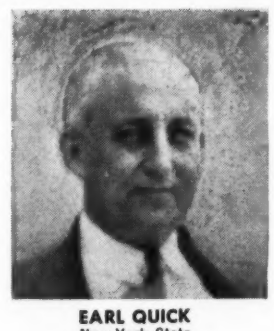
All-Industry Refrigeration & Air Conditioning Exposition
Public Auditorium, Cleveland, Ohio
January 26 to 29, 1948
FRIGID-FREEZE Booths: Nos. 508, 510, 512

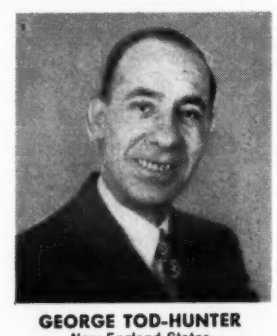
JOHN M. BESS
President

HARVEY FARBER
Manager, Nat'l Users' Accounts

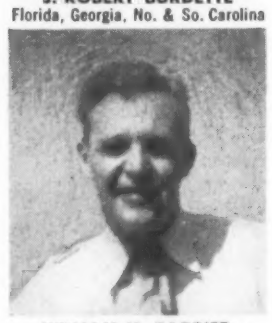
IRVING A. PONON
National Sales Manager

M. L. ACKERMAN
Metropolitan N. Y., N. J.


EARL QUICK
New York State

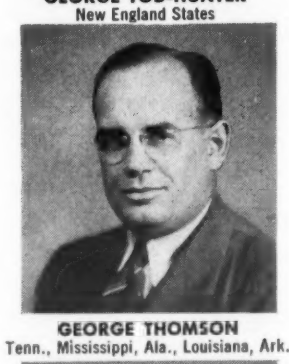

GEORGE TOD-HUNTER
New England States

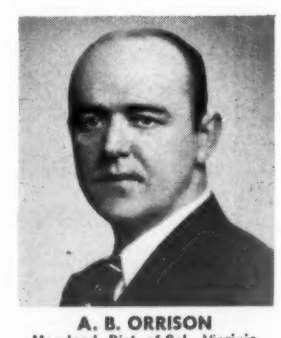
J. ROBERT BURDETTE
Florida, Georgia, No. & So. Carolina

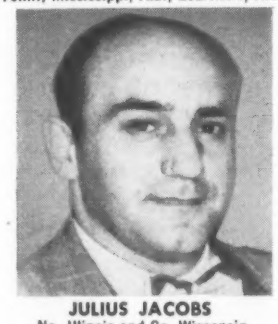

WILLIAM H. CARRIER
Ohio, Eastern Kentucky

It's always a pleasure to greet old friends . . . to make new friends.

Particularly so . . . when the Frigid-Freeze cabinets we have to show you contain so many new sales-stirring features that are news to the entire industry. Be sure to see the dynamic, complete line of commercial refrigeration equipment which can mean bigger sales, better business for you in 1948.


GEORGE THOMSON
Tenn., Mississippi, Ala., Louisiana, Ark.


A. B. ORRISON
Maryland, Dist. of Col., Virginia


JULIUS JACOBS
No. Illinois and So. Wisconsin

WENDELL STOOPS
Mo., Nebr., Okla., So. Iowa, Colo.

JAMES C. GANT
Texas, New Mexico

ERNEST MOWRY
No. California, Ore., Wash., Nevada

ROY HALLBERG
So. California and Arizona

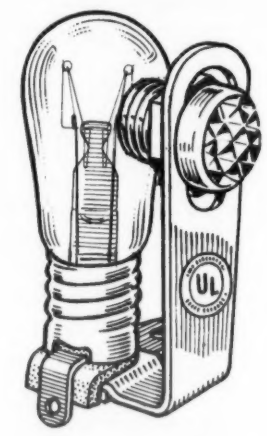
L. T. SMITH
Sales Promotion Supervisor

The Executives and Sales Representatives of

REFRIGERATION CORPORATION OF AMERICA
Barber, New Jersey
A DIVISION OF NOMA ELECTRIC CORPORATION

Frigid Freeze

DRAKE features ECONOMY



NO. 10C TYPE JEWEL LIGHT ASSEMBLY

Underwriters Approved

This newly designed No. 10C Pilot Light Assembly is the most reasonably priced UL listed 110 volt candelabra type to be had. What's more, it has an outstanding feature in wide adjustability of jewel position in relation to lamp filament—no matter what lamp is used, the center of the ½" jewel can be located directly in front of the lamp filament for maximum illumination.

This assembly is only one of the many available from Drake at low prices. Let us send you more detailed information.

ASK FOR OUR NEW CATALOG • NO OBLIGATION!

Socket and Jewel LIGHT ASSEMBLIES

DRAKE MANUFACTURING CO.
1705 W. HUBBARD ST., CHICAGO 22

COMMERCIAL CREDIT FINANCING PLANS FOR REFRIGERATION AND AIR CONDITIONING INDUSTRY INCLUDE WHOLESALE AND RETAIL FINANCING OF CABINETS, COILS, COMPRESSORS, FIXTURES AND RELATED EQUIPMENT . . . INDIVIDUALLY OR COLLECTIVELY. FROM BASIC STEP OF FLOOR PLANNING FOR DISTRIBUTOR TO FINAL PAYMENT BY PURCHASER THERE IS FOLLOW THROUGH TO INSURE SOUND AND PROFITABLE SALES. ANY QUESTIONS AS TO ADVANCES, RATES, MATURITIES OR RENEWALS CAN BE QUICKLY AND CLEARLY ANSWERED BY YOUR LOCAL COMMERCIAL CREDIT REPRESENTATIVE.

COMMERCIAL CREDIT CORPORATION

A Subsidiary of Commercial Credit Company, Baltimore

MORE THAN 300 OFFICES IN PRINCIPAL CITIES OF THE UNITED STATES AND CANADA

KRAMER TRENTON CO. Trenton, N. J.

New Items at All-Industry Show Aimed To Help Sellers and Users

(Concluded from Page 22, Column 5)

plate bank. Heat-X-Changer has an operating display of its cooler carbonator unit in booth 125. Acme Industries is displaying its new line of AP/FP evaporative condensers and new Blo-Cold forced convection unit in space 604.

NEW AIR CONDITIONERS

In the air conditioning line, G-E is showing several new items of equipment and packaged products, while Typhoon Air Conditioning Co. is introducing its console model 1½ and 2-ton package units.

For servicemen, the Jas. P. Marsh Corp. is exhibiting a new thermometer with four scales . . . Penn Brass & Copper is showing its Papco No. 500 tube cutting tool for tube sizes ⅛ to 1 in. o.d. . . . and Airserco is coming out with eight new products.

VALVES AND ACCESSORIES

And then there are Sporlan Valve's new Catch-All filter-dehydrator in ⅓, ½, and 1 ton sizes . . . Kerotest's new shut-off valves, integral forged manifolds, and global valves . . . and American Injector's new line of oil separators.

CONTROLS FOR HEAT PUMP

New 3-way and 4-way changeover valves for reverse-cycle (heat pump) refrigeration systems, shown operating in an actual heat-pump system, will be set up to attract attention in the Alco Valve Co. booth. Alco claims that these are the first controls specifically designed for heat pump operation. Also to be shown is a new snap-action suction valve.

APARTMENT REFRIGERATOR

Other highlights, in brief, among the complete refrigeration unit displays are the "Lo-Boy" 3½ cu. ft. apartment refrigerator for counter or under counter installation of Paley Mfg. Corp. . . . Crown Refrigerator Corp.'s stainless steel reach-ins.

Fogel's "Low-Boy" counter height case for wrapping, weighing, and displaying . . . Wilson Refrigeration's new two temperature refrigerator operating from one condensing unit . . . Franklin Refrigeration's new dairy cases.

Ward Refrigerator & Mfg. Co.'s Monterey line of meat and fish counter cases . . . Victor Products' candy display cabinet . . . and the Coleman Equipment Co.'s new Tuthill ice cream freezer.

ICE MAKER WITH STORAGE

There are also the La Crosse Cooler Co.'s 16 tray, self-contained ice cube maker with storage compartment . . . Westinghouse's new foot operated water coolers . . . United Refrigerator's new combination beer dispenser and bottle cooler.

A complete new model window type packaged air conditioner "with many radical improvements" is being shown by Pacific Mfg. Corp. Tecumseh Products is exhibiting a new domestic hermetic unit.

Hudson Products Co. is displaying its new three-way drink dispenser . . . Evans Mfg. Co. is featuring a redesigned line of full vision display cases . . .Tyler a line of commercial cases and freezers . . . Jordon self contained beverage coolers and commerical cabinets.

FROZEN FOOD EQUIPMENT

Orley is highlighting its new Super Seven freezer completely automatic in operation . . . Brewer-Tichener and McCray have new self-service frozen food cases . . . Arcade has a new super freezer lock and hinge with seal breaker for sharp freezing.

Imperial Brass is featuring its new "Hi-Duty" flaring tool . . . Wabash Mfg. is sectioning all its products to show details . . . Betz Corp. has a new line of commercial coils . . . Henry Valve is featuring its dual and triple stainless steel solenoid valves . . . Chicago Seal has a newly designed retainer bar for valve plate seats . . . A. O. Smith Corp. is pointing up its new line of single phase and polyphase electric motors . . . and Automatic Products Co. is displaying a variety of new valves.

Showing new condensing models are Schnacke, Inc., and Lehigh Mfg. Co.

USDA To Supply Food Data to Locker Plants

KANSAS CITY, Mo. — Foods in plentiful supply will henceforth be reported regularly to the various state group headquarters of the National Frozen Food Locker Association by the U. S. Dept. of Agriculture.

Tied in directly with the food conservation program, these monthly break-downs will indicate which areas have particular foods in abundance, the association said. The first report covers February, 1948.

Airserco Cuts Price On Control Tester

PITTSBURGH — Because of increased demand and larger production runs, the Airserco Mfg. Co., Inc. here, has announced a reduction in price of the Airserco thermostatic control tester, from $19.50 to $16.50.

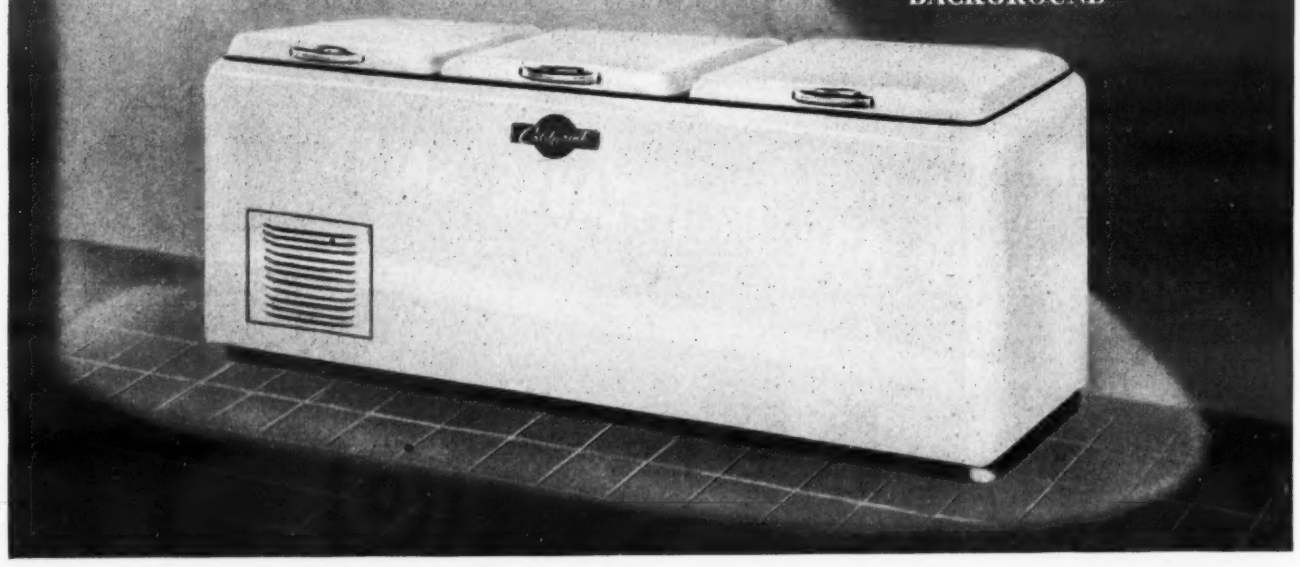
Also reduced in price from $15 to $13.75, is the solid copper Carrene Meter.

VICTOR PRODUCTS CORPORATION

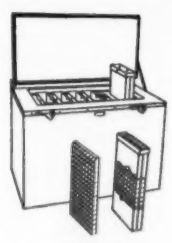
PRESENTS

Coldpoint

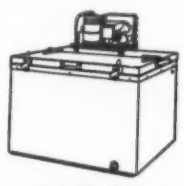
A NEW COMMERCIAL REFRIGERATION LINE WITH A DISTINGUISHED BACKGROUND



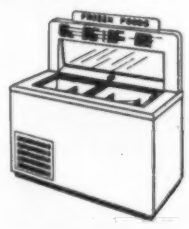
Victor Products Corporation of Hagerstown, Maryland, the oldest commercial refrigeration company in America is now introducing COLDPOINT...a new name...a complete and smartly styled new line. The COLDPOINT line will be sold by franchised distributors in exclusive sales territories, strongly supported by national advertising...backed up by full color window and point-of-sale displays...buttressed with dealer sales helps and consumer pamphlets in full color.


ICE MAKER

WALK IN ROOM


MILK COOLER

DRY STORAGE BEVERAGE COOLER


FROZEN FOOD DISPLAY CABINET

FUNKHOUSER SERVICE

ALERT distributors who want to tie up with America's oldest refrigeration manufacturer and 30 years of refrigeration 'know-how' can get aboard now. A wire . . . a 'phone call . . . a letter to King Noel, Vice President in charge of Sales, Victor Products Corporation, Hagerstown, Maryland, will receive quick attention . . . step on it.

ITS GEM FOR "48"

NOW AVAILABLE

IMMEDIATE DELIVERY

With Hinged and Sliding Doors

Stainless Steel

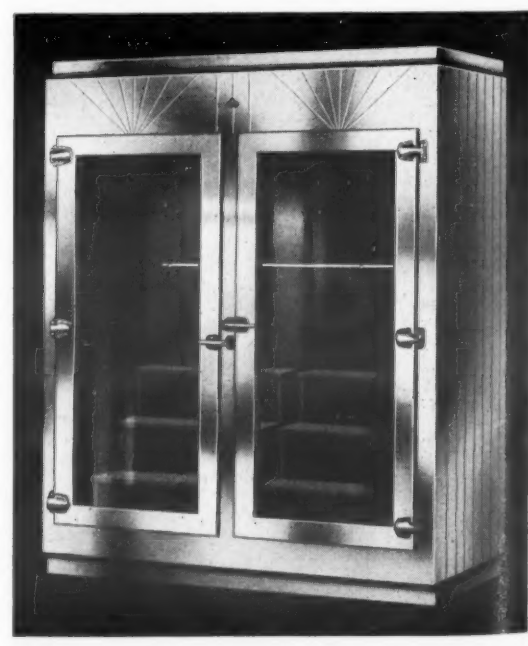
Fluorescent Lighting

Adjustable Display

Sectional or One Piece Construction

DEALER Inquiries Invited

FLORIST REFRIGERATORS



GEM REFRIGERATOR CO.

2539 Germantown Ave.
PHILADELPHIA 33, PENNA.

Refrigeration - Air Conditioning - Heating - Parts and Supplies

Same Day Service—From Our Complete Stocks

WHOLESALE ONLY

Request for latest Catalog on your "letterhead"

No catalog will be released without proper identification.

THE SUPPLY HOUSE THAT SERVICE BUILT

BUY FROM THE WHOLESALER THAT PLAYS BALL WITH YOU

SERVICE PARTS CO. 2511 LAKE STREET MELROSE PARK, ILLINOIS

Photographs He Takes Help Commercial Dealer Bring In More Prospects

AUGUSTA, Ga.—Owning a good flash camera, and putting it to work in making of "photographic newspaper advertising" is a policy which has paid rich dividends to D. M. Thomas Refrigeration Sales & Service Co. at 1271 Broad St. here—commercial refrigeration firm franchised with Tyler and Frigidaire commercial equipment.

Since V-J Day, when the organization began concentrating on food markets, butcher shops, and supermarkets, Owner D. M. Thomas has followed a policy of photographing every outstanding installation for self-service frozen foods, vegetables, meats, etc., and incorporating it in quarter-page newspaper advertising.

Each advertisement is a display type which tells something of the experience of the food market operator "before and after" installing self-service refrigeration, with a photograph of the new installation completely stocked and ready for business.

Almost every such photograph has brought in dozens of interested prospects, according to Thomas, who has been a franchised commercial dealer since 1939. For 1947, the company will sell $247,000 gross volume—most of this stemming from the "small retailer market," Thomas said.

"The photographic ads have played the biggest part in creating this volume," he said. "Without them the fact that a food store had installed new self-service refrigeration would be only hearsay to other retailers. With the photograph, however, they get an idea of how the food store operator placed his equipment, how he is merchandising it, etc.—and we feel that such photographs are the next best thing to a personal prospecting call."

The same idea is being used in the merchandising of locker-plant construction, according to Thomas. He recently completed two of the largest commercial locker plants in this section of Georgia, both of which were photographed in and out and reproduced in complimentary newspaper advertising. Both ads brought about an immediate response from investors and food store operators interested in setting up locker-plant service in conjunction, according to the Georgia dealer.

U.S. Grant Supply Plant To House All Divisions

LOS ANGELES — A new ultra-modern plant that will house under one roof all divisions of the U. S. Grant Supply Co., distributors here, has been acquired by the company, U. S. Grant, president, has announced.

The plant is located at 2900 E. 11th St., not far from the Furniture Mart.

Two spur railroad tracks, capable of accommodating eight freight cars, serve the shipping and receiving docks of the warehouse. Truck delivery docks open directly on the customers' parking lot, where scores of cars can be parked free of charge at one time.

Close to 50 carloads of ranges, heaters, refrigerators, freezers, and other appliances are arriving monthly, Grant declared. Before delivery to dealers, they are uncrated, inspected, serviced, and adjusted so that no damaged goods reach the trade, he added.

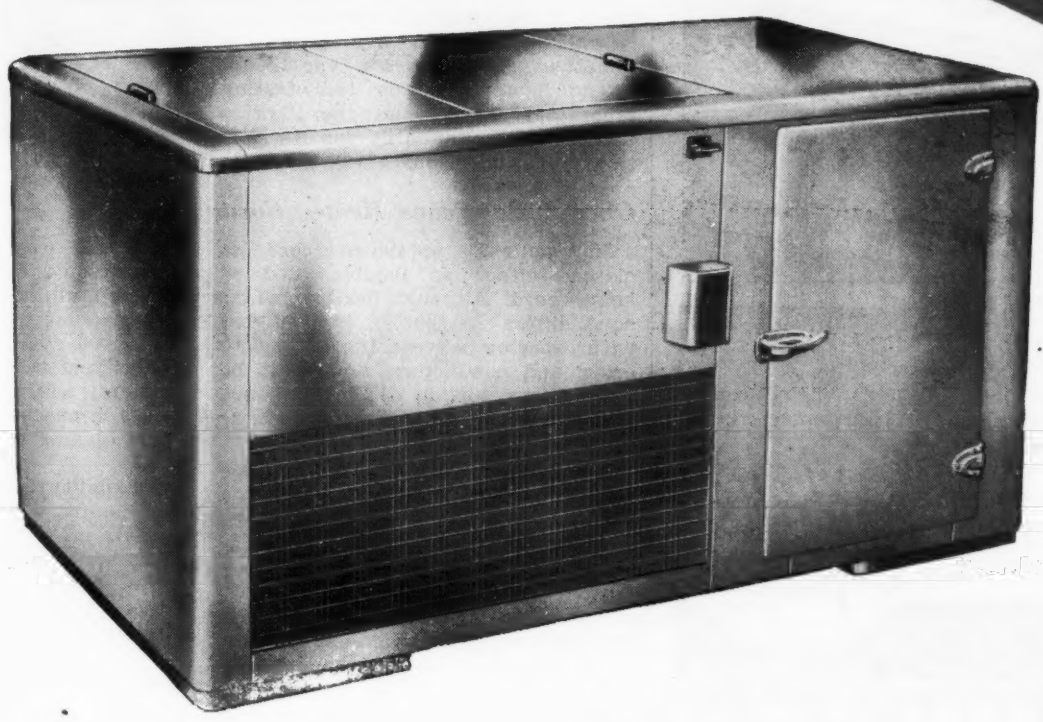
Delivery Racket Run By Chicago 'Con' Man

CHICAGO — Local residents have been warned by police of a "refrigerator confidence man" working the north side of the city. The man, who travels under several names, poses as a representative of a well known electrical manufacturing company.

Supplied with a brief case of pictures and descriptions of refrigerators, he tells his victims that their names have been selected by the company to receive free refrigerators for advertising purposes. All the unsuspecting housewife has to do is agree to show the refrigerator to friends and neighbors and pay a small delivery fee, usually $5.50.

It was estimated by Chicago police that the man victimizes 10 persons a day, receiving from five to 10 dollars from each.

ONLY ARTKRAFT HAS A COMBINATION FOOD and BEVERAGE COOLER THAT CAN BE OPERATED WET OR DRY



The ARTKRAFT BEV-FOOD

A High Quality, Self-Contained "Plug-in" Unit

- RETAILS AT ONLY $385 (f.o.b. factory)
- OFFERS THE LOWEST COST PER CUBIC FOOT USABLE REFRIGERATION SPACE IN THIS SIZE RANGE.
- EACH COMPARTMENT CAN BE USED ENTIRELY FOR DRY REFRIGERATION
- TOP OPENING PREVENTS "SPILL-OUT" OF COLD

IDEAL FOR:

RESTAURANTS	HOSPITALS
ROADSIDE STANDS	SODA FOUNTAINS
DAIRY STORES	BOWLING ALLEYS
HOTELS	MEAT MARKETS
TAVERNS	DELICATESSENS
FISH MARKETS	CANDY STORES
FACTORY CAFETERIAS	DRUG STORES

SPECIFICATIONS:

Sealed cabinet: 65⅜" x 38" x 29½"
Solid 3" insulation—Vermin-proof
Top compartment: 35¾" high x 20¾" wide x 15½" deep (Slightly over 6½ cu. ft.)
Food compartment: 21¼" wide x 28⅞" high x 20¾" deep (Slightly over 7½" cu. ft.)
Total storage capacity: 14 cu. ft.
Finish: Exterior—Silver Blue
Interior—Porcelain enamel
Top and 2 sliding covers, stainless steel
Condensing Unit: ¼ H. P., twin-cylinder air cooled Equipped with Tecumseh, Universal Cooler, or Copeland unit
Motor: ¼ H. P., 60 cycle, single phase, 1750 r.p.m., 110 volts, capacitor type
Refrigerant: F-12 Freon
Automatic light in food compartment
8-point cold control

DEALERS:

Ask your distributor for this great profit-maker—or write us for his name. Distributed in many areas by G. E. Supply Corporation.

DISTRIBUTORS:

Write for details of franchise for open territory

The Artkraft Manufacturing Corp.

Quality Products for more than a Quarter of a Century

200 KIBBY ST., LIMA, OHIO, U.S.A.

THIS COUPON FOR YOUR CONVENIENCE

THE ARTKRAFT MANUFACTURING CORPORATION
200 KIBBY ST., LIMA, OHIO, U.S.A.

☐ Please send the name of the BEV-FOOD distributor in this territory

☐ Please send details of distributors' franchise

NAME.....

FIRM.....

CITY.....

THE HOLL-INES CAP
Unconditionally Guaranteed To Stop Crosley Terminal Leaks
Purchased only thru your local jobber.

Insist on genuine Marlo Products
MARLO HEAT TRANSFER Since 1925

PROFITS
. . . are the rewards from efficient management . . . aggressive sales efforts . . . sound advertising . . . customer good will.
Serving the Refrigeration Industry Exclusively
C.R. MARKHAM Advertising
ADVERTISING INTELLIGENTLY PLANNED • EXPERTLY PREPARED • PROPERLY PRODUCED
National Security Bank Building
767 Milwaukee Ave., Chicago 22, Ill.

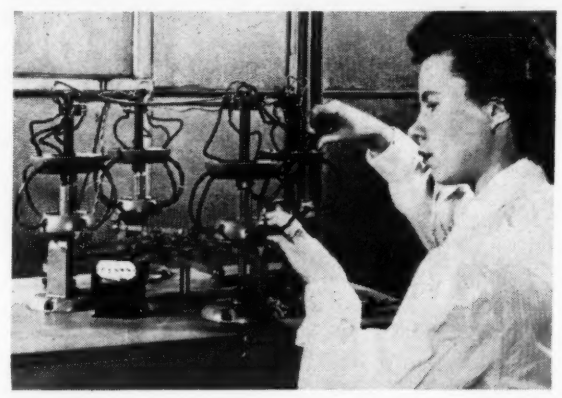
WILSON
REFRIGERATION, INC.
● FARM AND HOME FREEZERS
● REACH-IN REFRIGERATORS
● WALK-IN REFRIGERATORS
● FARM MILK COOLERS
DIVISION OF WILSON CABINET CO., INC.
SMYRNA, DELAWARE

Appliance's Use In Household as Well as Current Rating Are Among Factors Determining Proper Selection of Electric Cord

By B. F. Parr, Section Engineer, Appliance Engineering Department, Westinghouse Electric Appliance Division

Satisfactory performance from any electrical appliance depends to a large extent on proper selection of a cord particularly adapted for the job.

In cooperation with manufacturers, the construction of electrical cords and plugs has been standardized by the Underwriters' Laboratories, Inc. so that any cord, plug, or combination bearing the Underwriters' label meets certain minimum standards. Even though an approved cord may be entirely unsuitable for certain applications for which its type is not intended, approval by this testing laboratory means that the item is made to the standards for its particular classification.



A researchist attaches cords to a robot tester to determine their degree of flexibility. Oscillation, conducted at 32 times normal, is automatically recorded.

Over 250° Means Heater Cord

In general, appliance cord is classed either as flexible cord or heater cord. Although flexible, heater cord differs in that it is insulated with asbestos between the outer covering and conductors, and must be used if any portion of the appliance the cord may touch in normal operation exceeds 250° F.

The most common the flexible type are POSJ and SJ. The former is a rubber or plastic covered cord with parallel conductors—common applications being heating pads and floor lamps. The latter is a heavier rubber or plastic covered cord intended for more rugged service—to be used with vacuum cleaners, washing machines, etc.

HSJ and HPD are the two types of heater cord commonly used. For damp locations, heavy duty use, or where it is desirable to have an easily cleaned cord, the rubber covered HSJ is preferred. For domestic use where the cord is subjected to moderate wear, as on flat irons, a cotton covered HPD cord is preferred. For lighter domestic wear where appearance counts, as on waffle irons, rayon covered HPD cord may be used.

Important factors to be considered are the resistance to flex failure and the degree of flexibility required in the cord. Two classes of heater cords are used for appliances, depending on the number of flex cycles the cord will stand on a standardized test machine without failure.

A 3,000 cycle cord is used for the majority of table appliances, such as toasters; while one rated for 10,000 cycles is used where constant or frequent flexing is encountered, as on irons.

Flexibility is largely a function of the number and the size of the strands in the conductor. The total cross section area being the same, a large number of small diameter wires is more flexible than fewer strands of larger wire.

Shavers Use Tinsel Type

Tinsel cord may be used for extreme flexibility where the load does not exceed 50 watts, as on electric shavers. Instead of being round wire, the conductor strands in this cord are narrow and flat resembling a ribbon, and are wound helically with cotton or rayon core threads.

The correct gauge of wire must be used according to the current rating of the appliance. Eighteen gauge cord may be used up to 10 amperes, but 16 gauge must be used up to 15 amperes, the maximum current for all appliances used with a standard receptacle. These gauges allow current to be supplied to the appliance without appreciable voltage drop or overheating the cord itself.

Although some appliances use a cord that has a plug corresponding with pin terminals on the device, the tendency is to have the cord permanently attached whenever this method does not interfere with the use of the appliance.

On a coffee percolator, for example, a permanently attached cord would interfere with serving at the table. On appliances such as waffle irons, the internal temperature of the casing makes it impractical to take the copper wire inside for permanent attachment.

Permanent Where Possible

Although 6 ft. is the minimum length recognized as satisfactory, the length of cord is determined by the use for which the appliance is intended. Appliances such as the vacuum cleaner require much longer cord, or else of necessity would have to be used with some form of extension.

Color may be utilized if the cord is especially desired to harmonize with colors used on the appliance. Fabric covered cords may be obtained in any color with the variety of designs made possible by colored thread tracers. Rubber and plastic covered cords may be obtained in a variety of solid colors.

The selection of the right cord for a given use involves consideration of correct type, gauge, flexibility, covering material, length, and method of attachment, together with proper choice of color and tracer design.

Crider To Begin Output Of Saturn Units Soon

LIMA, Ohio—At the completion of the Crider Corp.'s pilot run of Saturn condensing units, the company intends to go into full production as quickly as possible, T. G. Crider, president and general manager, stated recently.

Westlake Mfg. Corp. of Canastota, N. Y. is conducting the pilot run and has contracted to make Saturn condensing units exclusively for Crider.

Crider added that the policy of his firm is to merchandise these condensing units directly to manufacturers of refrigeration cabinets, such as freezers, water coolers, two-temperature cabinets, display cases, ice cream cabinets, and milk coolers.

Both Guy V. Pollard, president of Westlake, and Vernon M. Roosevelt, vice president in charge of manufacturing for that firm, were formerly connected with Kelvinator. Pollard was general works manager for Kelvinator division and Roosevelt was in the manufacturing division.

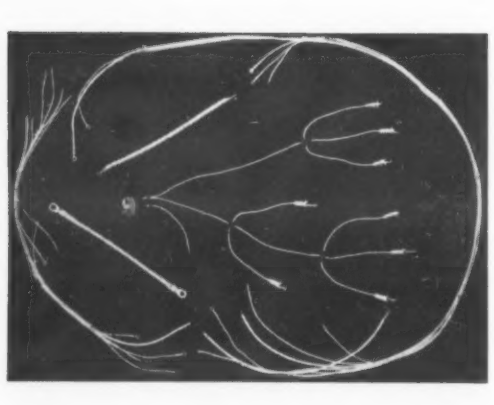
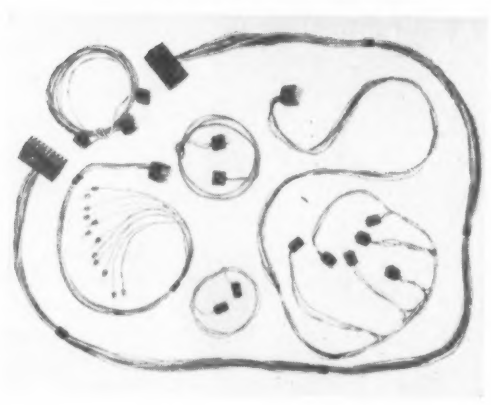
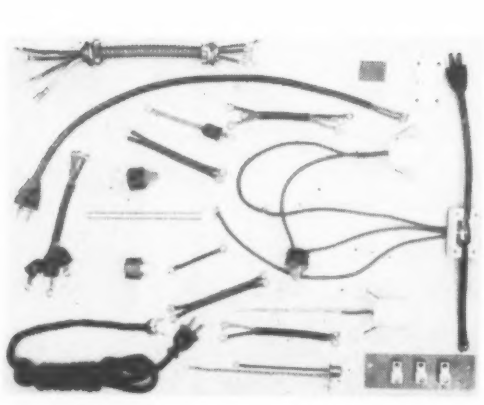
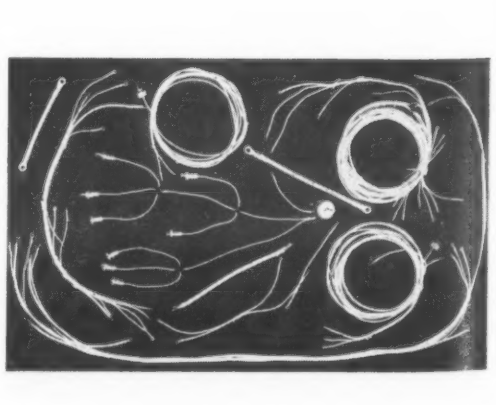
2 Coolerator Distributors Appointed In East, Midwest

DULUTH, Minn.—Appointment of two new distributors of Coolerator electric refrigerators and home and farm freezers has been announced by J. H. Ganzer, president of the Coolerator Co.

R. T. A. Distributors, Inc. of Albany, N. Y. and the Ozark Motor & Supply Co. of Springfield, Mo. are the distributors named.

Ozark Motor & Supply will handle the southwestern Missouri territory, and R. T. A. Distributors will represent Coolerator in eastern New York state, with the exception of the New York Metropolitan area which is handled by the D. W. May Co.

FOR *your* WIRING HARNESSES and DEVICES
RIVERSIDE OFFERS
PRODUCTION MANUFACTURING ADVANTAGES
● DESIGNED AND PRODUCED TO YOUR SPECIFICATIONS
● FREE ENGINEERING SERVICE
● IMMEDIATE DELIVERY

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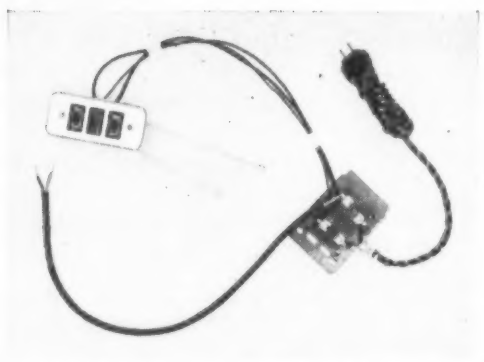
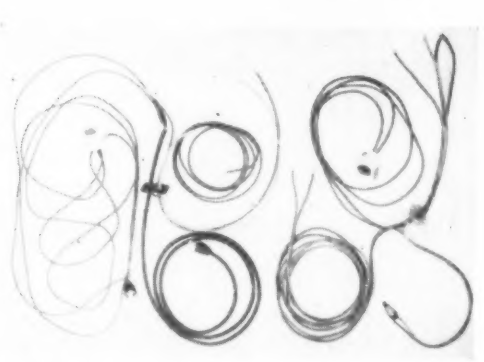
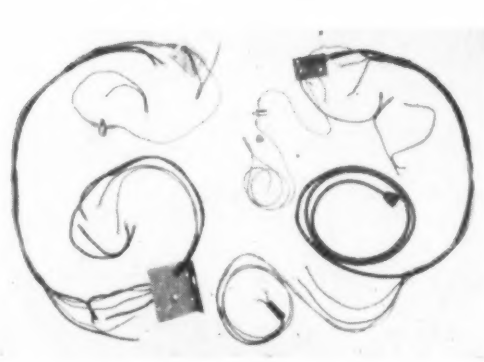

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Industry Standards for Units Nearing Completion

COLUMBUS, Ohio—The first of a series of recommended standards for the commercial refrigeration industry—this one dealing with open-type condensing units—was brought near completion at a third industry-wide meeting held recently at the Neil House here.

At the same session it was reported that "considerable progress was made toward the formation of a recommended industry standard for hermetic-type refrigeration condensing units."

Those attending the meeting were members of the Joint Engineering Committee of the Small Condensing Unit Industry, representing both ACRMA and REMA. Present were: A. B. Newton, Airtemp; A. D. Sullivan, Brunner Mfg. Co.; Lars Hanson and Mark E. Mooney, acting chairman, Carrier Corp.; J. L. Gibson and T. Benson, Frigidaire; C. H. Ehrenhardt, General Electric Co.; George Davis, Lynch Mfg. Co.; George Kingston, Nash-Kelvinator; C. E. Ploeger, Servel; W. W. Higham, Universal; H. A. Brysselbout, York Corp.; and Leonard C. Bastian, recording secretary.

The proposed draft of the recommended industry standard on open-type condensing units was circulated prior to the Columbus meeting throughout both the refrigeration and electric motor industries. Considerable time was spent at the session in reviewing comments of the National Electrical Manufacturers Association, the American Institute of Electrical Engineers, and the Motor Division of General Electric Co.

Another meeting of the Joint Engineering Committee has been called for March 22 and 23 at the Palmer House in Chicago to review a draft of the recommended industry standard for hermetic-type condensing units.

Art Nelson To Represent Kold-Hold Co. In Rockies

LANSING, Mich.—Kold-Hold Mfg. Co. has named A. J. "Art" Nelson as manufacturer's agent in the Rocky Mountain area.

A. J. Nelson

Nelson is thoroughly familiar with the Rocky Mountain territory, having traveled extensively there during the nine years following his training at Iowa university and the University of South Dakota. A former Army Air Forces captain, he was called to active duty in 1941.

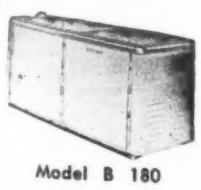
Adoption of the Kold-Hold line marks a forward step for Nelson's own Rocky Mountain business, which has claimed his full time since his return to Army Reserve status in 1945.

Shackleford Frigid-Freeze Franchise Covers 2 States

ATLANTA—The W. T. Shackleford Co. here has recently been granted the franchise in a large portion of Georgia and in the lower part of South Carolina for the Frigid-Freeze line of commercial refrigeration, manufactured by the Refrigeration Corp. of America, according to an announcement by the distributor.

Eugene Caverly is sales manager of the commercial refrigeration division of the Atlanta firm.

DEALERS WANTED



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Model B 180

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Bottle Capacity

180 12 oz. upright, 220 12 oz. corded

THE BEVCO COMPANY

1512 PINE ST., ST. LOUIS 3, MO.

'Production-Line' Dock Speeds Loading of Trucks With Parts for Refrigeration Service Calls

ST. LOUIS—A streamlined stock and truck-handling system has been developed by the Hampton Electric Co. at Kingshighway and Fyler here, which knocks many minutes per day off refrigeration service operations, according to E. H. Woestendieck, owner.

Under the plan utilized, a space of 150 x 80 ft. in the back of the Hampton Electric Co. building is devoted to service operations. A truck entrance is located at the extreme left-rear, with an exit at the right-front of the building so that trucks move through the interior in a continuous procession. The company maintains 8 panel trucks and 4 pickup trucks, in addition to "hotshot" cars, which bring out special parts and equipment under emergencies.

Flanking the drive on which the trucks move through the building is an all-metal, electrical parts stockroom, which contains thousands of all-steel, olive-drab-painted bins, which are adjustable by means of metal pegs to accommodate equipment of any size or shape.

Everything necessary for every type of repair work is stocked here, according to Woestendieck, with every item neatly identified by a label at the front of the bin, and kept to a minimum inventory point by means of parts books on a counter connecting with the driveway.

For maximum efficiency, it is not necessary for Hampton Electric mechanics to handle parts in any way, until they are actually on the job. For this reason, eight of the trucks maintain a perpetual inventory, valued at $750, which is sufficient for anything up to large-scale air conditioning work, and which the mechanics can rely upon to always be there.

Three stock clerks assigned to the stockroom have the responsibility of maintaining the perpetual inventory in each truck. On each job, the mechanic fills out a worksheet, which lists the hours expended on the job, number of parts used, with their serial numbers and description, and any special remarks. This is turned in at the end of the day, and a staff of three girls at the dispatch office extract from it the mechanic's time for payroll purposes, plus the parts which have been used, sending a notice to the stockroom to replace these.

The trucks are restocked during the evening hours, or in the early morning during slack periods, so that when mechanics come in twenty minutes of eight, they find their trucks ready to go.

Behind the stockroom window is a bulletin card with 32 clips, in which messages for any of the 32 employes of the firm may be posted on 4 x 5 sheets of white paper. Thus, if the stockroom is unable to supply certain needed parts, the "short" is called to the mechanic's attention before he leaves via the bulletin notice.

Hampton Electric has sufficient space within the building to keep all trucks parked indoors when not in service, a factor which has a lot to do with efficient restocking and appearance maintenance, says Woestendieck.

Henry back pressure regulator...

for accurate temperature control!

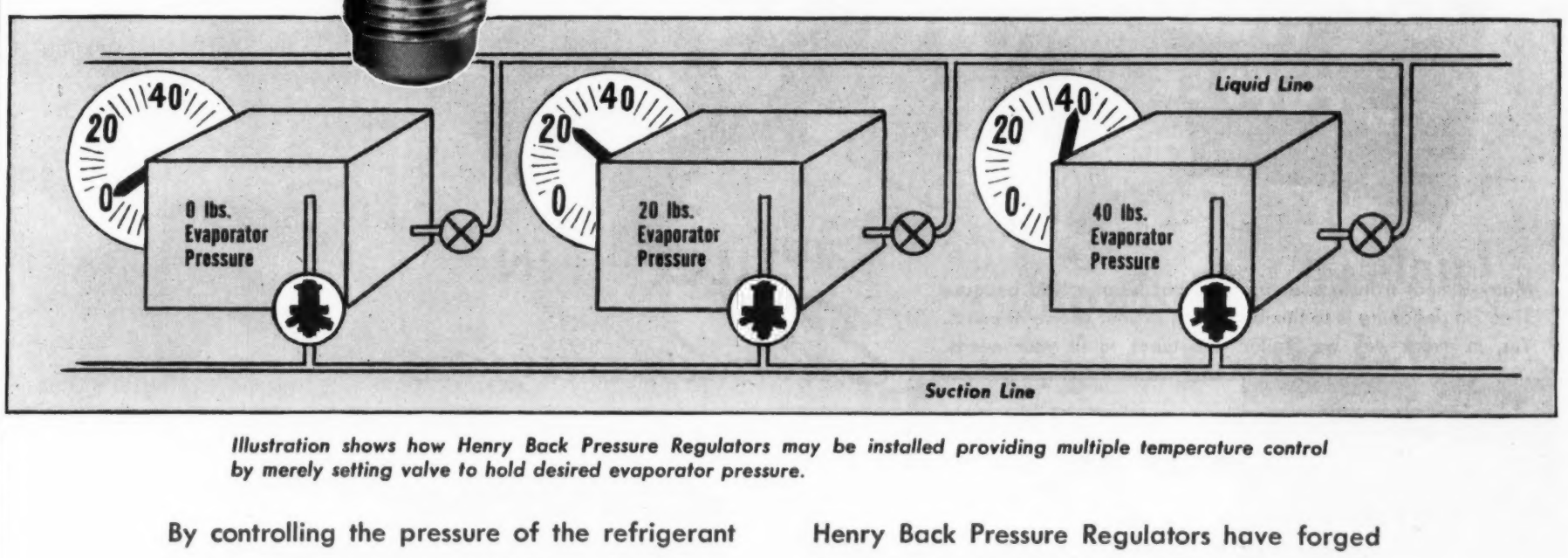

Illustration shows how Henry Back Pressure Regulators may be installed providing multiple temperature control by merely setting valve to hold desired evaporator pressure.

By controlling the pressure of the refrigerant in an evaporator, the use of Henry Back Pressure Regulators permits multiple temperature control on two or more refrigerated fixtures regardless of suction line pressures. Used on water or beverage coolers, they prevent freeze-ups. They operate on the principle that the temperature of the refrigerant within a vessel varies with the pressure. Therefore, regulating the pressure in an evaporator provides a positive temperature control of the refrigerant. They are recommended for Freon and Methyl Chloride installations within a range of 0 to 40 lbs. evaporator pressures.

Henry Back Pressure Regulators have forged brass bodies with stainless steel diaphragms. A gauge connection shut-off valve permits making accurate pressure setting at time of installation. Valve is set by turning screw controlling spring tension on diaphragm. The adjustment seal cap insures protection against leaks or freezing. Available in angle pattern with ½" and ⅝" flare or solder connections as shown. Also available with straight-thru connections on special order. Complete literature available upon request.

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Sales & Users of Commercial Units, Conditioning Shown In Detroit Data

By C. Dale Mericle

DETROIT — More comprehensive data on the actual installation of commercial refrigeration equipment in a specific area has been compiled by AIR CONDITIONING & REFRIGERATION NEWS.

The first such data ever published appeared in the Dec. 15, 1947, issue of the NEWS and was devoted to the city of Chicago. The statistics presented on this and the following pages apply to the city of Detroit, and in some respects are more comprehensive than the Chicago data.

Data was compiled from records of the Detroit Department of Buildings and Safety Engineering, which administers the city's refrigeration and air conditioning code, and also issues permits governing the installation of such equipment.

The Detroit data covers both air conditioning and remote commercial installations, and shows not only the number of condensing units by size which were installed in the city during the years of 1946 and 1947, but also shows where the units were installed, how the various makes compare, and how many contractors were involved in the commercial installations. Comparison is also made with the Chicago figures for the same period.

First, air conditioning. A total of 266 condensing units for air conditioning systems was installed in Detroit in 1946, not counting room coolers and window units, figures for which are not available. The 1947 total amounted to 423 units, a considerable gain over the 1946 figures.

This air conditioning data is broken down by size and by "central" and "self-contained" installations. As used in this survey, "self-contained" refers to those units which are packaged and installed within the conditioned space.

"Central" systems refer to those installations where the cooling equipment is in a remote location and is connected by ductwork to the conditioned space. This latter category, of course, includes package units which have been set up in a remote location.

In 1946, then, there were 64 condensing units installed in central systems, and 202 self-contained units installed. In 1947, the figures show 122 central and 301 self-contained units.

Breakdown by size of machine indicates that the 5-hp. unit was the most widely used. A total of 144 5-hp. units was installed in 1946, representing more than half of the total. In 1947 212 of the 423 machines were 5-hp.

Second in popularity for both years was the 3-hp. size, 59 being installed in 1946 and 73 in 1947.

Several machines of large size were installed in both years, however. Largest were two machines of 1,070 hp. which went into Detroit's largest department store in 1946. Other large machines were 450-hp., 300, 145, 100, and 75-hp. Sixteen of the latter were installed in 1947, five in 1946.

All in all, 5,229¾ hp. of air conditioning equipment was installed in Detroit during 1946, with the grand total for 1947 being 5,571¾ hp.

Seventy-two categories of establishments are represented in the tabulation of where this air conditioning equipment was installed during the two years. These range all the way (alphabetically) from an appliance store to a wine shop.

This tabulation shows the number of installations in each category and the total horsepower. A word of caution may be advisable before drawing conclusions as to how many establishments are actually represented by this tabulation. Generally the city of Detroit requires permits for each installation of the larger air conditioning equipment, and although any number of machines may be installed with a single permit, more than one permit may be issued during the year for installations in the same store, or factory say, each covering a separate installation.

Thus, the 32 "office" installations in 1946 may not necessarily represent 32 different offices, but there were 32 separate installations of air conditioning equipment in offices.

Rated by horsepower, department stores were the 1946 leaders, having a total of 2,660 hp. Second category

(Continued on next page)

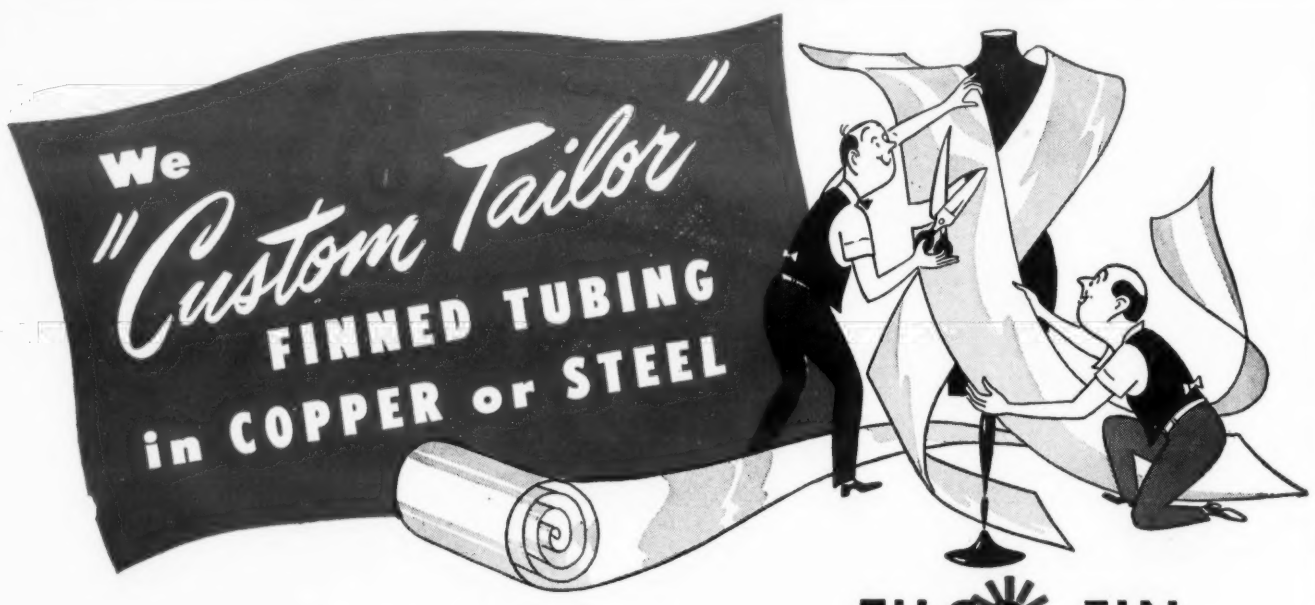
Size and Amount of Air Conditioning Equipment Installed In Detroit During 1946 and 1947

	1946			1947		
Size In Hp.	*Central	*Self-Contained	Total	*Central	*Self-Contained	Total
Less than 3 hp.	5	5	10	3	8	11
3	7	52	59	1	72	73
5	5	139	144	8	204	212
7½	11	1	12	11	7	18
10	8	4	12	7	4	11
15	5	1	6	23	6	29
20	3	..	3	13	..	13
24	1	..	1	..	..	..
25	1	..	1	13	..	13
30	1	..	1	4	..	4
40	..	..	..	7	..	7
44	1	..	1	..	..	..
48	1	..	1	..	..	..
50	2	..	2	7	..	7
55	1	..	1	..	..	..
60	..	..	..	6	..	6
75	5	..	5	16	..	16
100	2	..	2	1	..	1
145	1	..	1	..	..	..
300	1	..	1	2	..	2
450	1	..	1	..	..	..
Total 1,070	64	202	266	122	301	423

*"Central" systems are those where the air conditioning equipment is not located within the conditioned space, in contrast to the "self-contained" equipment which is installed within the conditioned space. Included in the "central" column, however, are a number of self-contained machines which have been remotely installed.

Where Air Conditioning Was Installed In Detroit During 1946 and 1947

	1946		1947	
Establishment	No.	Hp.	No.	Hp.
Appliance store	..	..	1	5
Auditorium	..	..	1	5
Bakery	6	70	1	5
Bank	2	213	9	520½
Beauty parlor	2	12½	1	5
Bookstore	3	25	1	5
Bowling alley	3	45	4	115
Brewery	..	..	1	5
Cafeteria	..	..	2	15
Candy manufacturing	3	13½	1	2
Candy storage	1	2	..	..
Candy store	2	29	..	..
Church	1	3	1	5
Clinic	2	10	1	5
Clothing store	11	76	8	102½
Commercial	1	5	..	..
Conference room	1	10	4	25½
Club	..	..	2	17½
Dairy bar	1	5	..	..
Dance hall	1	5	..	..
Dancing school	1	75	..	..
Dental manufacturing	1	8	..	..
Dentist	..	..	1	7½
Department store	5	2,660	6	375
Doctor's office	1	3	6	28
Drafting room	..	..	1	10
Dress shop	10	64	10	123
Drug manufacturing	2	5½	2	608
Drug store	1	3	7	62½
Dry cleaning	1	10	1	5
Egg wholesaler	..	..	1	5
Factory	14	212	11	994
Florist	..	..	1	5
Food processing	..	..	2	25
Funeral parlor	3	17½	3	17½
Fur store	1	10	1	10
Furniture store	1	15	1	15
Haberdashery	3	13	7	29
Hosiery shop	..	..	1	8
Hospital	1	3	3	45
Hotel	1	3	2	95
Jewelry store	5	35½	10	51½
Laboratory	3	22	2	50
Library	..	..	1	25
Lithograph plant	1	55	..	..
Market	1	10	1	10
Medical college	1	3	1	1¼
Music store	..	..	4	23
Office	32	742¾	62	920½
Pharmacy	1	3	..	..
Photo laboratory	1	5	..	..
Photo studio	..	..	2	11
Printer	1	3	..	..
Publishing house	..	..	1	10
Radio laboratory	1	5	..	..
Radio studio	..	..	2	30
Railroad depot	..	..	1	60
Refrigeration service shop	..	..	1	1
Residence	2	8	6	18½
Restaurant	30	170½	24	248
Salesroom	5	25	3	18
Salesroom, auto	2	10	7	41
Shoe store	7	63	5	38
Store	7	32	9	169
Storage	1	3	..	..
Tavern	21	147½	25	189
Theater	3	250	6	257½
Union auditorium	..	..	1	25
Union office	1	7½	..	..
Unknown	1	3	5	46
Warehouse	..	..	1	20
Wine shop	..	..	1	3
Total	213	5,229¾	286	5,571¾



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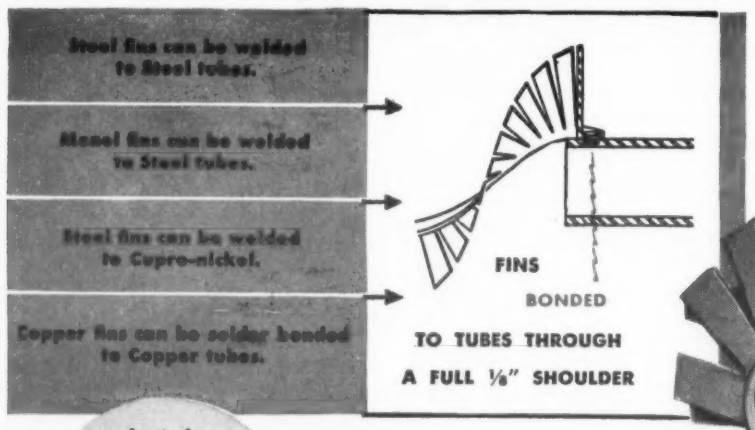
TUBING


Steel fins can be welded to Steel tubes.
Monel fins can be welded to Steel tubes.
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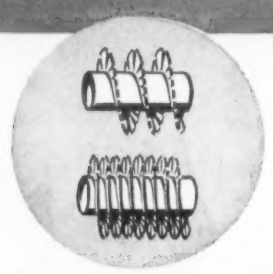
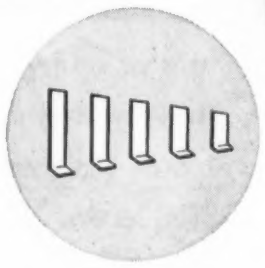
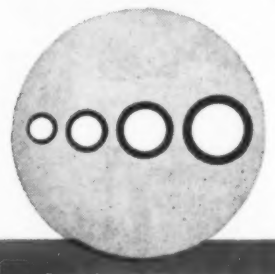


Fins may be spaced as wide as three rows per inch or as close as eight rows per inch.

Fins may be any desired height starting with ¼".





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Box 2651, Air Conditioning & Refrigeration News

Offices First In A. C. Installations

(Continued from preceding page)

in 1946 was offices with 742¾ hp. In 1947 top category by horsepower was the factory group with 994 hp., followed closely by offices with 920½ hp.

By number of installations, however, offices ranked first for both years, 32 having been made in 1946, and 62 in 1947. Second place in 1946 goes to restaurants with 30, while third place goes to taverns with 21. Restaurants and taverns, with 24 and 25, respectively, reversed their positions in 1947.

Considered as a whole, a broad range of types of establishments is represented in these Detroit figures on air conditioning installations.

Similar results are shown in the tabulations of remote commercial installations in Detroit for the two-year period. The grand total of such installations here for 1946 amounts to 1,616 units. In 1947 there were 2,093 units installed.

Analyzed by size of machine, more ½-hp. units were installed in both years than any other size, the 1946 total being 416; 1947, 510. Runner-up in 1946 was the ⅓-hp. size with 396. In 1947, however, the ¾-hp. size ranked second with 415 installations.

Studies of the statistics as to the installation of remote commercial machines by make for the two years is also interesting, especially when compared with similar data compiled for Chicago for the same years.

In Detroit the number of makes represented runs in the thirties, approximately the same as in Chicago. Top-ranking make in Detroit had 419 machines installed in 1946, and 415 in 1947. The second-place make in 1947 had 316 installations, third place, 188, fourth, 185.

The list runs down through "Z" which had only three installations in 1947. It should be noted, however, that included in the lower end of the list are some makes which concentrate on the largest size machines.

Comparison with Chicago data shows that make "A" in Detroit ranked "E" (fifth) in Chicago in the first eight months of 1947. "B" in Detroit was "A" (first) in Chicago. "C" was third in both cities. It will be noted, moreover, that the first five makes in Detroit were likewise the first five in Chicago, although their ranking differs somewhat.

Generally, the ranking by makes is pretty much the same in both cities, which is perhaps to be expected. There are some exceptions, however. Make "F" (sixth) in Detroit was "L" (twelfth) in Chicago. Chicago's "F" (sixth) fell to "P" (sixteenth) in Detroit. And "G" (seventh) in Detroit was included among the "others" or also-rans in the Chicago tabulation.

The study of contractors making remote commercial installations was limited to 1947. During this 12-month period 136 contractors installed 2,093 machines. This is an average of 15.4 machines for each contractor, which was exceeded by 28 contractors.

At the top of the list is one contractor who installed 230 machines, representing 10.9% of the total installed. In second and third place were firms that installed 155 and 154 machines, respectively.

At the low end of the list there are six firms who installed six machines each; three who installed five each; 14 who installed four each; 10 who installed three each, and 39 firms who installed one each.

Thus, these 72 firms installed a combined total of 176 machines. This works out to be 52.9% of the firms installing 8.41% of the units for the year. This is in contrast with the top end of the list where four contractors (2.9% of the total) installed 662 machines (31.7% of the total).

A tabulation was also made of the type of establishment where these remote commercial machines were installed for both 1946 and 1947. This shows that these machines went into a total of 78 different types of establishment.

Here again it should be stated that there may be some duplication in the figures given under the number of

(Continued on next page)

1946 Remote Commercial Installations by Size by Month

Month	⅓ hp.	½	¾	1	1½	2	3	5	Over 5*	Total
January	41	47	18	16	1	..	1	..	3	127
February	52	25	21	9	4	2	1	2	2	118
March	58	28	28	16	3	4	1	4	2	144
April	59	47	22	7	2	6	5	..	3	151
May	60	37	23	13	4	1	1	8	6	153
June	21	33	8	20	15	6	..	1	3	107
July	19	24	21	45	10	4	4	..	2	129
August	13	31	19	19	17	7	4	3	1	114
September	21	30	18	35	13	7	1	2	6	133
October	14	29	18	21	13	24	3	2	..	124
November	26	52	48	40	21	6	4	5	3	205
December	12	33	19	22	7	13	4	1	..	111
Total	**396**	**416**	**263**	**263**	**110**	**80**	**29**	**28**	**31**	**1,616**

*Includes four 7½-hp. machines, one 8½, seven 10, seven 15, four 20, five 25, one 27, one 30, and one 75-hp. machine.

1947 Remote Commercial Installations by Size by Month

Month	⅓ hp.	½	¾	1	1½	2	3	5	Over 5*	Total
January	14	21	34	24	10	6	1	1	4	115
February	18	41	33	29	14	6	4	1	8	154
March	24	43	26	31	19	14	4	5	7	173
April	27	43	35	46	19	19	5	4	6	204
May	26	48	40	36	11	14	9	6	22	212
June	46	54	34	43	17	15	8	5	6	228
July	35	56	54	39	17	11	4	6	6	228
August	7	28	26	22	9	2	4	2	5	105
September	34	78	34	26	16	5	6	3	8	210
October	27	40	30	21	17	7	7	1	4	154
November	27	25	28	43	12	6	2	..	..	143
December	44	33	41	24	12	7	2	2	2	167
Total	**329**	**510**	**415**	**384**	**173**	**112**	**56**	**36**	**78**	**2,093**

*Includes one 7-hp. machine, 12 7½-hp., one 8, 25 10-hp., 19 15-hp., five 20, two 30, two 38, three 40, and one each of 50, 60, 75, 100, 125, 200, 250, and 500 hp.

Installations by Make of Remote Commercial Machines In Detroit During 1946 and 1947

Detroit Ranking 1947	Chicago Ranking 1947	Detroit Sales 1946	Detroit Sales 1947
A	E	419	415
B	A	161	316
C	C	236	188
D	B	88	185
E	D	100	174
F	L	102	132
G	*	108	114
H	G	48	96
I	H	33	86
J	K	52	48
K	M	44	45
L	Q	12	40
M	J	12	36
N	P	12	30
O	S	19	28
P	F	11	24
Q	R	12	23
R	V	19	19
S	N	22	14
T	Y	8	10
U	U	4	9
V	*	..	8
W	*	18	6
X	*	1	4
Y	*	7	3
Z	*	1	3
Others	..	47	37
Total		**1,616**	**2,093**

*Included among "Others" in Chicago tabulation.

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Where Remote Commercial Machines Were Installed In Detroit In 1946 and 1947

Establishment	1946 No.	1946 Units	1947 No.	1947 Units
Apartment house	14	17	13	18
Bakery and bakery shop	35	37	38	42
Bank	..	..	1	1
Baseball park	1	5	..	..
Beer store	6	6	29	30
Blood bank	..	..	1	1
Bookbinder	1	1	..	..
Bottle cooling	..	..	1	5
Bottling plant	1	1	..	..
Bowling alley	2	2	7	7
Brewery	2	2	3	3
Cafeteria	10	37	9	21
Candy manufacturing	2	3	1	1
Caterer	5	5	3	3
Cheese factory	1	1	..	..
Church	..	..	3	3
Cigar factory	1	1	..	..
Clinic	1	1	..	..
Club	8	10	7	11
College dormitory	..	..	1	1
Commercial (unspecified)	51	54	..	..
Confectionery	35	36	32	32
Dairy	7	15	6	12
Dairy bar	5	5	16	22
Dairy store	11	12	12	16
Department store	8	12	7	11
Dog food store	..	..	1	2
Doughnut shop	1	1	..	..
Dress shop	..	..	1	1
Drug manufacturing	8	11	5	6
Drug store	7	7	41	62
Exhibit	2	4	..	..
Factory	14	20	7	11
Fish wholesaler	..	..	2	2
Fish market	3	3	..	..
Florist	38	38	41	41
Food importer	1	1	..	..
Food processing	4	5	7	12
Food store	574	647	829	998
Food wholesaler	8	9	13	18
Frog market	..	..	1	1
Fur Vault	1	4	5	5
Greenhouse	1	1	..	..
Hall	1	1	6	6
Hospital	13	18	17	24
Hotel	8	13	4	4
Ice cream manufacturing	5	6	12	14
Ice plant	1	1	1	1
Institution	7	7	8	12
Laboratory	1	1	4	4
Locker plant	..	..	1	3
Malt processing	..	..	1	1
Meat casing manufacturing	..	..	1	1
Meat packer	13	15	6	8
Medical college	2	2	..	..
Newspaper office	2	3	1	2
Office	3	3	4	4
Pharmacy	1	1	..	..
Photo studio	1	1	2	2
Poultry and frozen foods	1	1	..	..
Railroad	1	3	..	..
Residence	1	1	..	..
Restaurant	202	229	117	243
Salesroom	..	..	1	2
Sausage manufacturing	5	5	4	4
School	6	6	3	3
Sprout farm	..	..	1	1
Stadium	..	..	1	1
Storage	2	2	3	4
Store (unspecified)	15	17	28	30
Tavern	171	212	192	214
Telephone exchange	..	..	1	2
Theater	..	..	3	3
Truck refrigeration plant	2	2	3	3
Union hall	..	..	1	1
Unknown	40	41	85	87
Warehouse	10	10	10	10
Yeast storage	..	..	1	1
Total	1,383	1,616	1,665	2,093

Food Stores, Restaurants, Taverns Lead as Detroit Commercial Users

(Continued from preceding page)

each establishment for the same reason that applied in the air conditioning figures.

Permits are taken out each time an installation is made, and in the course of a year, conceivably, two or more separate installations might be made in the same store. The total number of *units* listed for each category is an accurate figure, however.

Food stores, ranging all the way from the small corner grocery to the biggest supermarket, had by far the largest number of installations; 647 machines in 1946 and 998 in 1947. In second and third place were restaurants (229 in 1946, 243 in 1947) and taverns (212 in 1946 and 214 in 1947).

As in the air conditioning installations, a broad range of establishments is covered—apartment houses, banks, blood banks, factories, cafeterias, churches, dairies, dairy bars and stores, meat packers, newspaper offices, a union hall, clubs, institutions, truck refrigeration plants, the baseball park, a sprout farm a yeast storage room, and even a dog food store.

A quick check of the installation table will show, as is to be expected, that food preservation in various forms is by far the chief application. Drink, water, and otherwise, ranks second.

Another interesting study of this commercial refrigeration data is indicated in the graph which shows sales of remote commercial units by month in both Chicago and Detroit. The Detroit figures run for the full 24 months of 1946 and 1947, while the Chicago statistics go from January of 1946 through August of last year.

In general, both graphs follow somewhat the same pattern. Both show a slight drop from January to February of 1946, and then a rise to May, which was the high point of the first six months of that year. Both drop in June, Detroit fluctuates slightly from then through October, zooming to the year's high in November, and dropping sharply in December.

Chicago dropped in July, reached peaks in August and December with some fluctuation intervening, and then nose-dived in January of 1947.

Sales climbed for both cities in February, Detroit's continuing steadily to reach highs for the year in June and July before plunging to the year's low in August.

Chicago, however, reached a peak in March, dropped somewhat in April, and then reached another peak in July, as did Detroit. Chicago sales likewise fell off in August, although not as sharply as did Detroit's.

Figures are not available for the last four months of the year in Chicago, but the graph for Detroit shows a sharp recovery in September, downward trends in October and November, and a slight upsurge to finish off the year.

It is questionable whether either of these graphs can represent a normal seasonal trend for an average year, because of the unusual conditions of supply and demand which have marked the postwar period.

The big problem since the war has not been selling equipment but obtaining delivery. At least that was true in 1946. Early in 1947, however, it was noted by some in the commercial industry that supply was catching up with demand, at least on some items.

This trend may be reflected in the graphs. Commercial equipment was in better supply in the second half of 1946 than in the first half. This is shown not only in the graphs but in a study of the actual figures. In Detroit 700 machines were installed in the first six months of 1946, compared with 916 in the second half. In Chicago 1,832 went in the first half; 2,226 in the second half of the same year.

Percentage-wise, the Detroit figure for the first six months of 1946 was 43% of the year's total, while Chicago showed 45% in the same period. In the first half of 1947, however, the Detroit installations accounted for 52% of the year's total. Lack of 12-month data prevents a similar comparison for the 1947 Chicago installations.

Another question which may arise

(Concluded on next page)

Number of Remote Commercial Installations by Size In Detroit For 1946 and 1947

Size In Hp.	1946	1947
⅓	396	329
½	416	510
¾	263	415
1	263	384
1½	110	173
2	80	112
3	29	56
5	28	36
Over 5	31	78
Total	1,616	2,093

A-1

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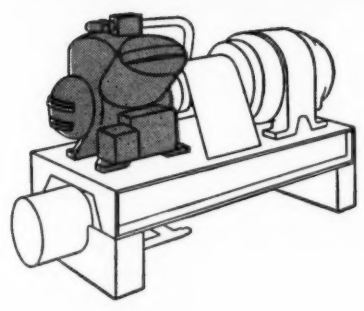

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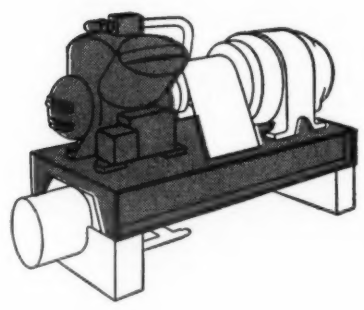

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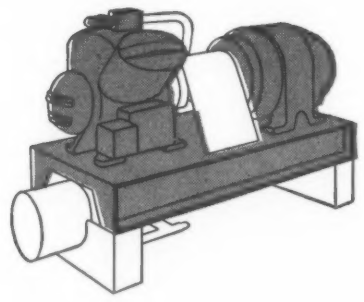

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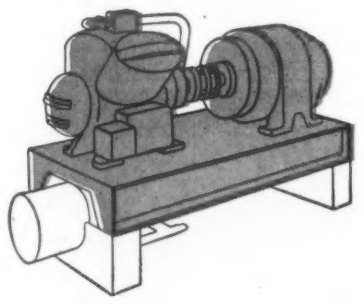
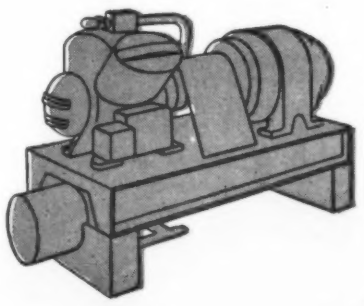
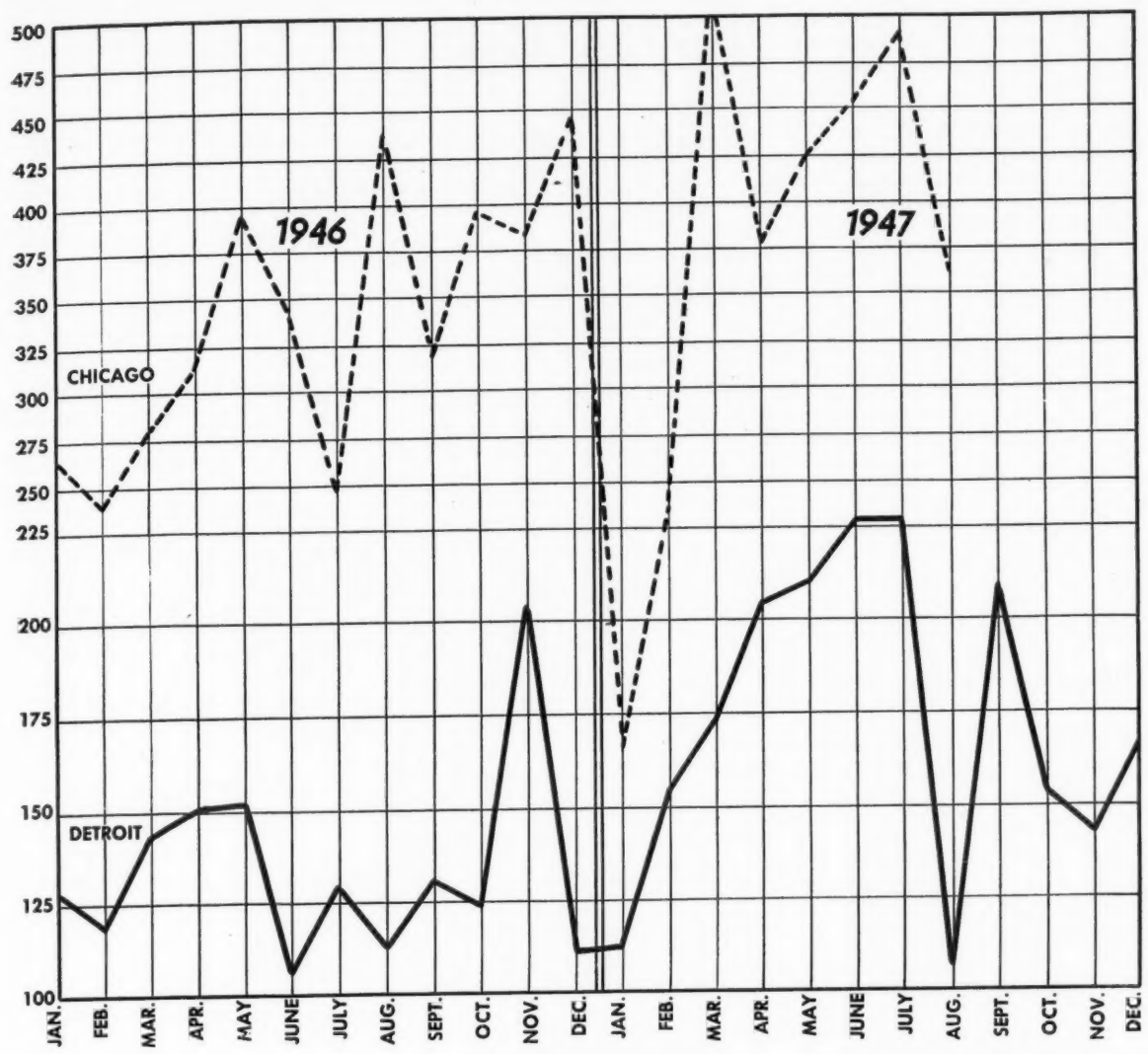


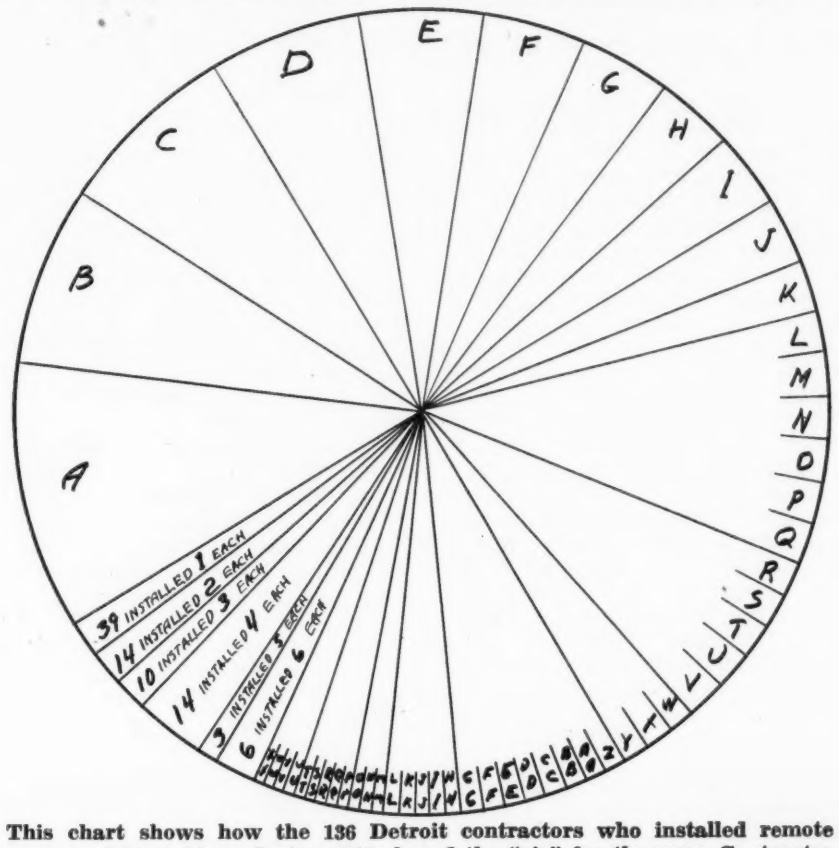
5 You get a medium or low temperature condenser—whichever best fits your requirements



Postwar Sales Trends of Remote Commercial Units



136 Detroit Firms Shared Remote Jobs



This chart shows how the 136 Detroit contractors who installed remote commercial machines during 1947 shared the "pie" for the year. Contractor "A" garnered 10.9% of the total with 230 remote machine installations, while at the other end of the list were the 39 firms who installed only one machine apiece.

Detroit, Chicago Sales Compared

(Concluded from preceding page)

in comparing the Detroit data with that of Chicago is the relation of the total figures to the population data of the two cities. In 1946 the population of the city of Chicago (not the so-called metropolitan trading area) was estimated as approximately 3,450,000. In Detroit the comparable figure is 1,800,000. Thus Chicago's population is 1.9 times that of Detroit.

The 1946 remote commercial installations in Chicago were 2.5 times those in Detroit, while in the first eight months of 1947, Chicago installations ran 2.1 times Detroit's.

Obviously, there will be some relationship between the population of an area and the number of commercial machines (or most anything else) sold there. The figures for Chicago and Detroit have a moderate close relation to population differences, but Chicago does have the edge.

Perhaps this could be explained by the fact that Chicago is a convention city and may have a proportionately larger number of restaurants and taverns than does Detroit. Accurate comparison on this score cannot be made, but in 1947 in Detroit, tavern and restaurant installations accounted for 19% of the total, while a study of a selected Chicago area revealed that these two categories accounted for 25% of the installations there.

In this same small Chicago area food stores accounted for 40% of the installations, but in Detroit they accounted for 50%.

Number of Contractors Who Installed Remote Commercial Machines In Detroit During 1947

Contractor	No.	%
A	230	10.9
B	155	7.4
C	154	7.4
D	123	6.0
E	93	4.5
F	88	4.2
G	79	3.8
H	63	3.0
I	62	3.0
J	59	2.8
K	44	2.1
L	40	1.9
M	40	1.9
N	40	1.9
O	38	1.8
P	38	1.8
Q	36	1.7
R	35	1.6
S	35	1.6
T	33	1.6
U	33	1.6
V	32	1.5
W	24	1.2
X	22	1.1
Y	20	1.0
Z	19	0.9
AA	17	0.8
BB	16	0.8
CC	15	0.8
DD	15	0.8
EE	14	0.8
FF	13	0.7
GG	13	0.7
HH	12	0.6
II	12	0.6
JJ	11	0.5
KK	11	0.5
LL	10	0.5
MM	9	0.4
NN	9	0.4
OO	9	0.4
PP	8	0.4
QQ	8	0.4
RR	8	0.4
SS	8	0.4
TT	8	0.4
U	7	0.3
VV	7	0.3
WW	7	0.3
XX	7	0.3
6 firms installed 6 each	36	1.7
3 firms installed 5 each	15	0.7
14 firms installed 4 each	56	2.7
10 firms installed 3 each	30	1.4
39 firms installed 1 each	39	1.9
Totals 136	**2,093**	**100.0**

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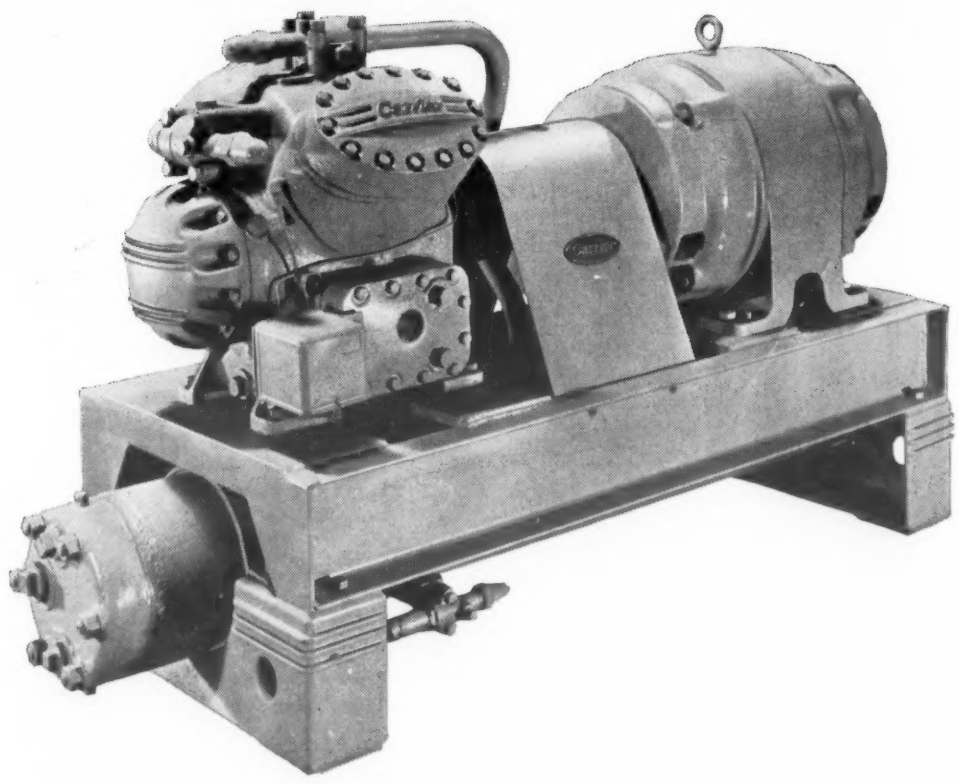

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Missouri Wholesaler Moves Appliance Dept.

KANSAS CITY, Mo.—A new location for the Jenkins Music Co. wholesale appliance and home furnishings department will be provided soon in the firm's warehouse at 21st and Wyandotte St. One of the most modern wholesale display quarters in the country will be opened to dealers in western Missouri and eastern Kansas about April.

The wholesale department has expanded over the basement and sixth floor of the Jenkins' retail store at 1217 Walnut St., making a move to a more suitable location necessary.

The entire second floor of the 7-story warehouse is being remodeled and modernized to house the department, and some 9,000 sq. ft. will be occupied with the display of heavy, hard merchandise, such as refrigerators, home freezers, and a complete line of electrical equipment for home use, K. G. Gillespie, manager, said.

Two operating kitchens are among the displays.

Maurer Back at Redmond As Engineering Director

OWOSSO, Mich.—Paul H. Maurer, former executive engineer of Redmond Co., Inc., has returned to the company after a three-year absence to assume the newly-created post of Director of Engineering, in which he will be in charge of all engineering work in the company, including research, development, and product engineering.

Coming to Redmond Co., Inc., originally from the Hudson Motor Car Co. in 1943, Maurer left Redmond 18 months later to become manager of industrial sales and later chief engineer for the National Pneumatic Co. in Rahway, N. J.

During the war he did the engineering work in setting up a Link Trainer production plant in Jackson, Mich., in a move to make production of the crucially important pilot-training machine less vulnerable to outside attack than it had been when concentrated in one plant on the East Coast.

Selling 'Bulk' Ice Cream by Weight Instead of Carton Saves Time, Increases Per-Unit Profit 9%, Sales 40%

ST. LOUIS—Selling ice cream by weight rather than in the standard flat-price cartons has boosted both monthly gallonage and profit per sale for Chris Brandt, operator of Brandt Drug Service at 2337 S. Kingshighway Blvd. here.

The Brandt store's ice cream sales are now averaging around 900 gallons a month during the summer months, and 700 gallons a month through the fall and winter period. Even in January and February of 1947, ice cream sales showed a 40% increase over the same period of 1946.

Full credit, says Mrs. Brandt, in charge of the fountain, goes to the fact that the store since May of last year has sold ice cream exclusively by weight.

"We have found that scooping ice cream into a flat tray, weighing it out at a set price per pound, and packaging it in waxed paper has many advantages we had never suspected," Mrs. Brandt said. "For one thing, our profit now averages 33⅓% on each sale instead of the customary 24% we earned before, and the same policy may be extended even to sundaes."

The changeover occurred after the Brandts had made a trip to Decatur, Ill., as guests of a St. Louis ice cream manufacturing plant, to study a similar operation in a large Illinois drugstore. Finding that this drugstore had been able to boost its ice cream sales to something like 100,000 gallons a year, Mr. and Mrs. Brandt enthusiastically returned to St. Louis and tossed out all former methods of handling ice cream.

In the center-rear of the fountain, Mrs. Brandt installed a sanitary white scale with reading up to 10 lbs., and a wooden bin, below the center backbar, which accommodates waxed paper, white bags, and handy waxed paper scoop-type trays, similar to those used in meat markets for packaging hamburger.

Since that time, the Brandt store has sold all ice cream used at the fountain, or taken out in carry-home packages exclusively by weight. The price, during late 1947, was 65 cents for 24 oz., 35 cents for 12 oz., with a sliding scale for "selling any amount of ice cream the customer wants."

"It took a little while to convince our customers that the new method of packaging was as acceptable as the carton method," Mrs. Brandt smiled. "The system we use is to take one of the small trays, place it on the weighing platform of the scale and scoop the ice cream directly into the tray without pressing it down until the amount is what the customer asked for.

"The tray is then wrapped in waxed paper, stapled shut, and slipped into a double-thickness white paper bag, which is rubber-stamped with our store name, address, and telephone number, as well as the ice cream manufacturer's name. The waxed paper and double-thickness bag protects the ice cream just as well as the former cylindrical carton, and now that it has become popularized among our customers, we find that they actually prefer it."

Ice cream sales by weight are more profitable due to the fact that fruit-flavored ice cream is much heavier, and that it is much easier to package it, according to Mrs. Brandt.

"Perhaps the most important thing is that we are not squeezing the ice cream down as we formerly were required to in filling cartons," Mrs. Brandt pointed out. "This, of course, meant that we were often giving out more ice cream than the customer paid for.

"In addition, we are effecting a considerable saving in packaging cost. We figured that the quart-sized round container with lid cost us around three cents each, and the pint container about one and one-half cents. Compared to this, the simple scoop-type tray which we use costs less than one-half a cent apiece when ordered in large amounts, and the waxed paper and bags are furnished free by the ice cream manufacturer," she stated.

The Brandt store, which maintains a six-stool soda fountain, across which all ice cream is sold, also uses the weight system on sundaes.

"We use a paddle to scoop out the ice cream for sundaes at 20 and 25 cents," she pointed out, "allowing five or six ounces per sundae. In this way, we keep our ice cream cost per sundae at a predetermined level, and customers prefer the larger-size spread which the sundae covers, which makes it easier to eat, and keeps the syrup or flavoring more evenly spread."

Sundaes, incidentally, are served in the waxed paper trays, which also eliminates dishwashing.

"We think that the tray packaging method makes ice cream much easier to handle at home, is just as convenient to handle, and certainly creates much more attention," Mrs. Brandt said.

Still another advantage is the fact that by rubber-stamping the scoop-type tray with the name of the store, telephone number, etc., the tray "does a selling job" in the home which is impossible with a standard manufacturer's cylindrical carton.

"People see our name on either the tray or the white paper bag when ice cream is served at parties, the dinner table, etc., and come in to order some for themselves," Mrs. Brandt summed up.

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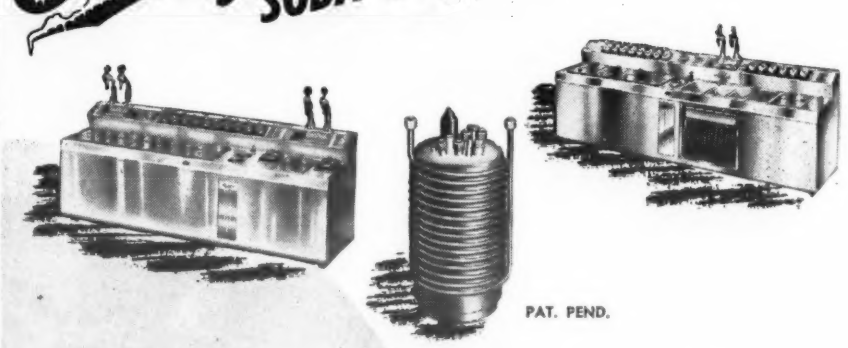

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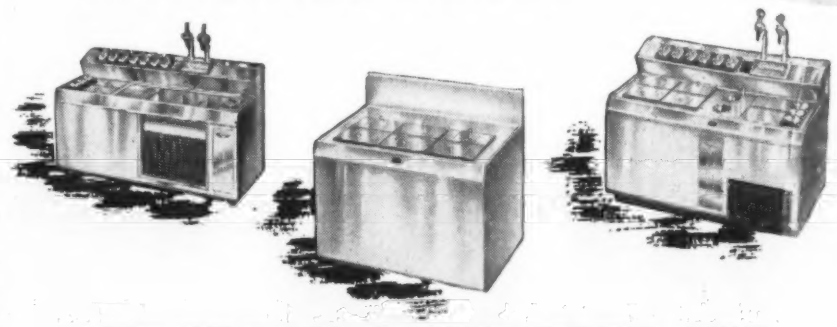

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Shift In Dairy Plant Refrigeration Needs Brings Demand for New Kind of Equipment

Trend to Sweet Water and Ice Storage Systems and Direct Expansion for Ice Cream, Described to ASRE

ATLANTIC CITY, N. J.—"Dairymen are badly confused by the intense rivalry between ammonia and 'Freon' machine manufacturers" and they also need much more interchange of ideas between themselves and the refrigeration industry, asserted Dr. R. J. Ramsey of the Ramsey Laboratories in a talk before the annual meeting of the American Society of Refrigerating Engineers here.

The dairy industry, he said, is composed of little plants (the largest chain having only 3% of the nation's plants), and these small plants don't have expert engineers or maintenance men and they must keep their capital investments low.

Thus, they must depend upon the refrigeration industry for much of their guidance, but they are often "confused by the opposing opinions of this industry," he commented.

"In the dairy business we must increase our efficiency because the margin of profit is getting smaller and smaller. The government establishes the prices we pay to the farmer, and the labor prices, and our competition is very strong. Just now the dairy industry is experiencing an economic upheaval—caused by paper milk containers."

High quality of product is essential in the industry, he continued, and many times it is necessary to sacrifice efficiency to maintain quality.

"We find that peak refrigeration demands are extremely high. We may have 100 tons now and then only 15 tons five minutes later. Generally today we are designing plants for only five to eight hours operation, and labor is the cause of that.

"Brine, which was used commonly in the past, is fading out of the picture rapidly. It caused too much trouble. Dairymen first went from brine to direct expansion but now the trend is to 34° sweet water systems.

"In the newer plants you'll find either sweet water or ice storage equipment, and we do need some flywheel effect in our refrigeration plants. Dairymen today are thinking a great deal about ice storage systems to knock off the peak loads," said Dr. Ramsey.

"Demand charges are also important for the dairy plant, raw milk cooling providing the greatest load. If the latent heat plant is ever advisable, it is for raw milk cooling.

"For ice cream many prefer direct expansion systems. Sweet water can't do it usually because there's not enough temperature difference.

"For the hardening of ice cream, dairymen say they are having a lot of trouble with blowers in -20° F. hardening rooms. Some are being installed in separate rooms for ease of servicing.

"Fast hardening does improve ice cream, but the brake horsepower is greatly increased. This fact isn't usually told to dairymen, and most people can't detect the difference between the two ice creams."

Summarizing the major refrigeration problems confronting dairymen today, Dr. Ramsey listed four:

1. Whether or not to go into latent heat equipment.
2. Satisfactory frost control.
3. When should a booster compressor be installed?
4. Lack of constant load. This requires more variable capacity of machines, but how should this be obtained?

Nebraska Farmers Find Milk Coolers Vital to Marketing Milk In Omaha

OMAHA, Neb.—Omaha's milk ordinance is indirectly creating a demand for mechanical milk coolers throughout a sizable area in eastern Nebraska and western Iowa, according to M. B. Crabill, assistant public health engineer.

It comes from the desire of farmers in the area to sell their milk to Omaha dairies, and they can't do that until their farms have been inspected to see that they comply with Omaha's milk ordinance, which includes a low bacteria count in milk and that in turn requires storage of the milk at proper temperature.

About 34,000 gals. of milk are received daily in Omaha. It comes from more than 2,600 producers from as far as Red Oak, Ia., on the east, Missouri Valley, Ia., on the north, Nebraska City, Neb., on the south, and Scribner and Hooper, Neb., on the northwest.

Safeguarding this milk supply is a major job and considerable progress has been accomplished since Crabill took over the task last May. He is a graduate of the University of Nebraska, post-graduate student of the University of Michigan, and now has a staff of four men to assist him.

When he began work last May, the average bacteria count for all milk was 3,300,000, whereas the Omaha ordinance limits it to not more than 750,000 per cubic centimeter for standard grade milk and not more than 200,000 for grade A milk. By July the count had dropped to 1,600,000 in that part of the Omaha milkshed where the health department was concentrating its work. Late last fall, the count had dropped to 115,000.

A result of the sanitation enforcement campaign has been considerable action by farmers in installing proper cooling facilities, concrete floors, etc., and cleaning up in general.

Jordon Refrigerator Co. Adds to Facilities for Production and Sales

PHILADELPHIA — Large scale plant alterations expected to result in greatly increased production have been completed by Jordon Refrigerator Co. here.

Many new pieces of automatic equipment were added in all departments as part of the alteration program, and the additional space and new machinery will result in broadening of the Jordon line this year, the company announces.

The factory now occupies five acres adjacent to the main line of the Pennsylvania Railroad, and has private sidings thus permitting direct transfer of shipments to and from freight cars.

After Feb. 1 the sales division of the company will occupy a new wing of factory, which will include a large and modern factory showroom. This division has been located in downtown Philadelphia at 235 North Broad St.

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Page 3D-1, Engineering File

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FERRO-THERM SAVES PAY SPACE — because a wall of Ferro-Therm occupies only 50% as much space as a wall of mass insulation of equivalent insulating value.

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It reflects 90-95% of all radiant heat
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Start 1948 with plans for *space-saving, cost-saving, faster-cooling* Ferro-Therm Steel Insulation — insulation that is better in every way for every type of structure. Mail the coupon now for complete details.

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January 26-29, Public Auditorium, Cleveland, Ohio

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THE INSULATION THAT *pays* — IN PAY LOAD AND PAY SPACE

INSIDE DOPE

by GEORGE F. TAUBENECK

(Continued from Page 1, Column 1)

Poland, and imports wax from China."

"Remarkable," grunted his temporary companion, contentedly sipping his ale.

"Remarkable is the word for it," agreed the narrator. "How can so many people in so many places earn a living off of something I haven't paid for yet?"

You Tell Me Your Dream

There's an old legend about a salesman and his midnight dream which deserves resurrection. It seems that this salesman dreamt that he was privileged to visit the compartments of Heaven and Hell reserved for those departed souls who were members of his profession.

In his tour of Hell, he noted that the "shades" of passed-on salesmen were forever hungry and perpetually teased. They were seated at a table groaning with sumptuous food, but they couldn't eat because their arms were splinted to a rigid, four-foot long spoon.

To a former salesman, this was Hell. Confronted with rich, succulent food, he couldn't eat or drink because he couldn't bend his elbow.

Heaven was different. Although the deceased spirits of earthly salesmen were also handicapped in Heaven by this long-handled spoon, these lads were fat and happy. They ate regularly, often, and continuously.

How?

The answer is simple.

In Heaven, the rigid-digit salesmen spooned up food from the heaping platters by extending their stiff arms (and the strapped-on spoon) to a convenient distant dish. These helpings of food they scooped up from five-feet-away they passed on to men seated across the table from them. No man fed himself; but everyone ate well.

There's a Moral to this anecdote. . .

Intolerance

In a certain jerkwater town whose name we shan't disclose, intolerance was rampant. Synthetic class hatreds were focussed upon anyone who wasn't a native-born white, Gentile Protestant.

Hoping to capitalize on this ugly mob spirit, a barbershop hung out a sign: "We Are 100% American."

Business doubled overnight.

So a rival barber put a sign in his window which read: "I am 200% American."

Proprietor of the first shop, after reading this ambiguous placard, couldn't restrain himself. He walked into his rival's cubbyhole and protested:

"You can't be 200% anything."

"Oh yes I can," returned the mathematics-defyer. "You only hate the Catholics, the Jews, the Negroes, and the foreign born. I hate everybody!"

It was a tense moment at the local movie. The hero had just slapped the heroine right smack on her beautiful puss.

In the midst of the surcharged silence, a little boy cried out:

"Why doesn't she hit him back like you do, Mommy?"

Women Are Impatient— Darn It!

"Could I have a week's vacation, sir?" plaintively asked the 22-year-old clerk. "I'm planning on getting married."

"Harrumph! Er, how long have you been acquainted with your fiancee?" asked his boss.

"We . . . ell, almost a week, sir," stuttered the youngster.

"That's not long enough. You don't know what you're doing. Why, when I was your age . . ." etc., etc., fumed the Old Man. "You wait for a month or so, and if you still want to get married, maybe I'll give you a vacation."

Several months passed. Then, one glorious spring morning the slap-happy boy again asked his boss for a week's leave-of-absence to get married.

"Why, that's fine," commended his superior executive. "After waiting all this time, you can be sure that you really love the young lady. I'm proud of you. The very fact that you have remained interested in the same girl for so long a time does you credit."

"I beg your pardon, sir," interjected the office boy. "This isn't the same girl. The brunette I was so crazy about couldn't wait. This one's a blonde."

There's a Housing Shortage . . .

Hand-in-hand, the starry-eyed couple arrived at the County Clerk's office, along with their "best man," and applied for a marriage license. The clerk asked the prospective bride and groom for their certificates of health. They didn't have any, so he sent them to a doctor down the street.

The latter took blood specimens from the prospective bride and groom—and then the "best man" extended his arm, too.

Grinning broadly, the doctor pointed out that it wasn't necessary for the "best man" to be tested.

"Better examine me,, too," sighed the B.M. "They're moving into my apartment with me."

Fat Face

Not long ago, on a Detroit streetcar, we witnessed the following tableau:

Apparently thinking that she had spied her husband sitting ahead of her in the street car, a cute miss tiptoed up and hugged this mistaken-identity gentleman.

Surprised and flustered, the gent turned around. He was obviously a total stranger to her.

"Oh-h-h," the girl blushed, "I'm so sorry. Your head looks just like my husband's behind."

Write Your Own Caption

Social status in Hollywood is anything but secure. Your rating, apparently, is no better than the success of your last picture or the lifting of your last option.

Some few stars, of course, manage to retain their places in the insecure Hollywood firmament year after year. But they are under no illusions as to the permanency of their social status. As one perennial star explained it to a visiting friend from Broadway:

"Honestly, any morning you may wake up to find yourself a Has-Been. Why, only today I shot a scene with a flock of 'extras.' It was positively appalling to discover how many of these non-entities were former friends of mine."

Advertisers' Holiday

When David (age 11) turned down an invitation to spend the night with a boyfriend, his mother asked him "how come."

(Continued on next page)

At these 2 big shows... VISIT

FRIGIDAIRE

5th ALL-INDUSTRY REFRIGERATION and AIR-CONDITIONING EXPOSITION—Jan. 26-29, Public Auditorium, Cleveland, O.

8th INTERNATIONAL HEATING and VENTILATING EXPOSITION—Feb. 2-6 Grand Central Palace, New York City

INSPECT...

A Dramatic Frigidaire Showing in Cleveland

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- Dry Beverage Coolers
- Store Air Conditioners
- Ice Cream Cabinets
- Home Freezers
- Forced Air and Gravity Cooling Units
- Water Coolers
- Famous Meter-Miser Mechanism
- Reciprocating Compressors
- Installation—Service parts and accessories
- Striking photographic display of other Frigidaire products

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Of Frigidaire's Air Conditioning Products in New York

Space 401-404

- Room Coolers
- Store Air Conditioners
- Central System Equipment
- Famous Meter-Miser Mechanism
- Reciprocating Compressors
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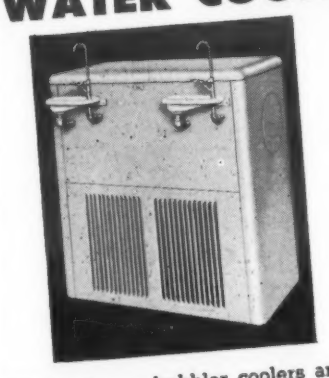
ELECTRIC IRONER • AUTOMATIC ELECTRIC CLOTHES DRYER • KITCHEN CABINETS AND SINKS

CABINET

DRINKING WATER COOLERS



Glass filler or bubbler coolers are available with capacities up to 25 gallons per hour. Cabinet of heavy steel welded construction with white baked enamel surface. Also available now — normal and high suction pressure water coolers for commercial use.

Write for latest data.

DAY & NIGHT

REFRIGERATION DIVISION

DAY & NIGHT MFG. CO.

One of the Dresser Industries

MONROVIA, CALIFORNIA

SOLD THROUGH REFRIGERATION WHOLESALERS AND DEALERS

INSIDE DOPE

by GEORGE F. TAUBENECK

(Continued from preceding page)

Jeered David: "He just wants me to help him eat up his breakfast cereal so he can have the box tops!"

Big Business

"And what did you do at your last place of employment?" the personnel interviewer asked the applicant for a job.

"Well, sir, I was a doer."

"Huh?" repeated the puzzled personnel officer, "how's that again?"

"Well, it was like this: when the Boss wanted something done he'd tell his secretary; the secretary would tell the department manager; the department manager would tell his assistant; and the assistant would tell me to do it.

"There wasn't anybody for me to order around, so I was the doer."

After paying for a dozen doughnuts, the customer joshed the little boy who seemed to be in charge of the pastry shop.

"Aren't you tempted to eat one of these frosted doughnuts now and then?" he teased.

"Oh, my, NO!" replied the urchin. "That would be *stealing*. All I do is lick the frosting and put 'em back."

Men Are All Alike

Tearful and contrite, a pretty girl hurried to confront a policeman who was directing traffic near a large department store.

"Mister," she addressed him in an anxious tone, "have you seen my husband? I was suppoosed to have met him here three and a half hours ago."

"Darned if I know, lady," he responded. "How would I be able to recognize him?"

"Well . . .," she pondered a moment. "His complexion has probably turned a deep purple by this time."

Women Have Claws

Last Thursday we came across an attractive young woman who was in a helluva stew, mentally. She didn't exactly know whether she had been insulted or not.

It all started one day while this obviously pretty girl was shopping for a hat. The salesgirl who waited on her brought out various and sundry screwy designs—all having veils attached.

"Look," declared the pretty girl, "I don't like veils."

"But, Madam," insisted the salesgirl, "you have just the face for a veil."

You can take it from there.

Where There's Smoke, No Fire May Have Occurred

In a tiny Canadian fishermen's village there dwelt two inhabitants who shared the somewhat unique name of Whippleworth. Misfortune, in one devastating stroke, entered the lives of both on the same day. One of these luckless individuals lost his wife during a frightful hurricane, and the other lost his boat.

In due course, the minister's wife decided to call on the bereaved husband. By mistake, however, she arrived at the house of the Whippleworth whose boat had been wrecked.

"We all wish to extend to you our greated sympathy for your sad loss," she began.

"Oh, I didn't mind," was the casual reply. "She was getting pretty old and didn't amount to much."

Up shot the eyebrows of the curate's wife. This was a most unexpected and scandalizing attitude for a widower to take, she thought.

"Sure," continued the wrong Whippleworth, "it was probably for the best. I had her insured, anyway. I had been trying to swap her with some of my friends, or trade her in on a newer model. Yep, I'd been wanting another one for a long time."

Picking up her modestly long skirts, the shocked lady ran from the house, on the double-quick.

Moral to this story: Never believe what you see or hear before you get your facts straight.

YOU CAN'T DO A WHOLE SELLING JOB WITH ONLY HALF A LINE!
With the 1948 JORDON line you can meet every demand—sell every market!
JORDON dealers go everywhere—go after every prospect, profit continuously by JORDON'S progressive policy. JORDON'S nation-wide distributing and selling organization can hit the selling line hard because it is supported by a *smart* line—a *promotion* line—and a *complete* line!
The JORDON 1948 line is the best rounded, most saleable, most versatile in JORDON'S half century of experience. And now, with greatly increased production facilities, JORDON dealers can look forward with assurance to increased sales, increased profits, and a year of even greater prosperity.
★ DISPLAY CASES: 4 Ft. to 10 Ft. All finishes—Porcelain, Stainless Steel, Enamel. Full vision, Double Duty and Counter Height Models. All new 1948 models, designed for in-line installations.
★ WALL DISPLAY CASES: 6 Ft. and 8 Ft. Porcelain front. Adjustable shelves. For clerk or self service.
★ FROZEN FOOD CASES: Display merchandisers for frozen foods and ice cream. Available with matching illuminated superstructures. Popular sizes. Also "Town and Country" storage-freezer for homes, farms, and commercial uses. Temperature adjustable to sub zero temperatures.
★ REACH-INS: 20 Cu. Ft. to 60 Cu. Ft. Available with ice-makers, blower coils, meat hooks, freezer-locker. Two-temperature and all low temperature models. Porcelain, Stainless Steel, Enamel. JORDON 14/6 REFRIGERATOR includes: 14 Cu. Ft. standard refrigeration, 6 Cu. Ft. freezer-locker, 16 lbs. ice cubes, ONE condensing unit—one control.
★ BEVERAGE COOLERS: Dry cold suitable for all bottled goods and foods. Meets latest sanitation codes. Smart modern design. Stainless Steel and Enamel. Self-contained and remote models. Capacities up to 30 cases.
We are now prepared to handle additional distributors and dealers. Inquire now for full information on the new JORDON 1948 line.
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AMERICA'S MODERN COMPLETE LINE
JORDON REFRIGERATOR CO.
Factory and Sales Division
58th St. and Grays Ave., Phila. 43, Pa.
CABLE: "JORDONREF"
BElgrade 6-4510

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SULFUR DIOXIDE
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See Your
ANSUL WHOLESALER

These Ansul Refrigerants have a long record for DRYNESS, PURITY and DEPENDABILITY. You will like Ansul's friendly service.

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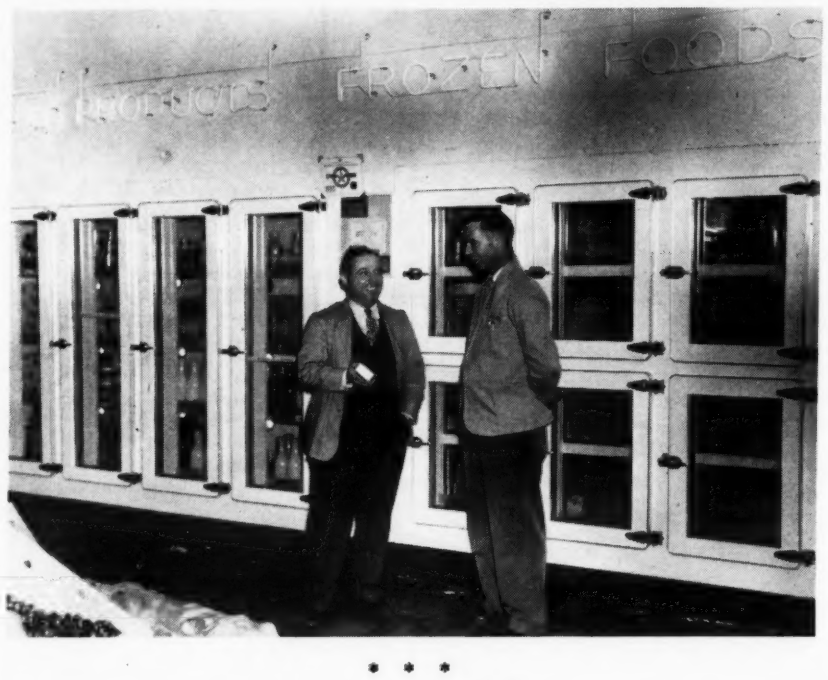
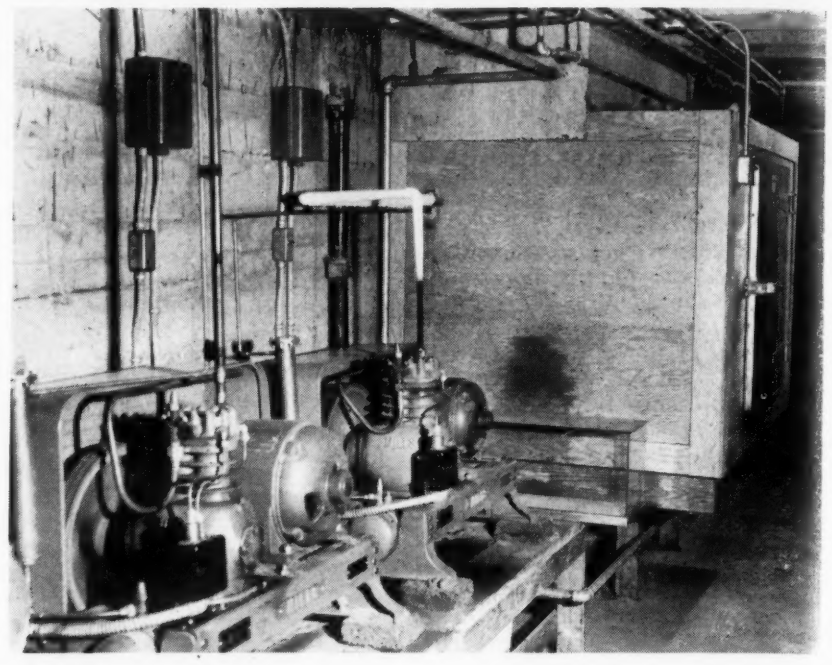
Distributors for Kinetic's "Freon-11," "Freon-12," "Freon-21," "Freon-22" and "Freon-113"

Insist on genuine Marlo Products
MARLO HEAT TRANSFER
Since 1925

Dairy Items, Frozen Foods Easy To Pick Out





(Above) Blower box supplying zero-temperature air to frozen food reach-in is located at rear. In foreground are Mills compressors. (Left) Don Ramsey and Irv Walker, co-owners.

* * *

64 Ft. of Cases, 3 Holding Rooms, and Frozen Food Reach-In Aid Store's Sales

BELLEVUE, Wash. — From the strictly mechanical point of view, two factors—the automobile and modern refrigeration—are primarily responsible for the success of one of the largest and most attractive food stores in the Pacific Northwest.

This, at least, is the opinion of Don Ramsey and Irv Walker, co-owners of the Food Center here, whose drive-in supermarket grossed nearly a million dollars its first year of operation.

Located in the new Bellevue shopping center approximately 15 miles and a toll bridge away from the city center of Seattle, the firm nevertheless does nearly one-third of its business with Seattle residents, the balance with other drive-in patrons some of whom live as far as 50 miles from the area. Without the automobile, of course, such a venture would have been out of the question.

Fully as essential to the firm's operation has been its refrigeration installation consisting of 64 ft. of meat and delicatessen cases, a meat holding box, frozen foods holding room, vegetable holding room, and its unique self-service reach-in box for frozen foods. The latter was specifically designed for the Food Center, and has proven unusually successful in promoting sales of frozen delicacies.

The solid bank of meat and delicatessen cases illustrated here, includes two Hussmann self-service cases and four triple-pane Viking meat cases. The latter are refrigerated by a single 1½-hp. compressor, the Hussmann cases by two ¾-hp. compressors.

The meat holding box located directly behind the reach-in milk and frozen foods boxes, measures 18 x 11 ft. and is refrigerated by a 1½-hp. compressor.

Particularly convenient in the handling of meat is the overhead track for incoming meat which runs from the loading platform at the rear of the store, through the warehouse and meat cutting room and into the holding room.

There it is stored preliminary to cutting for display in the meat cases. Another feature which customers appreciate, is the bacteria ray equipment installed in the meat coolers.

The reach-in frozen foods box was something of an experiment designed to eliminate the need for customers to paw through the boxes of food to find the article they want. By having a reach-in box similar to the dairy products box which adjoins it, customers can find what they want without difficulty, and are more likely to purchase other items as well.

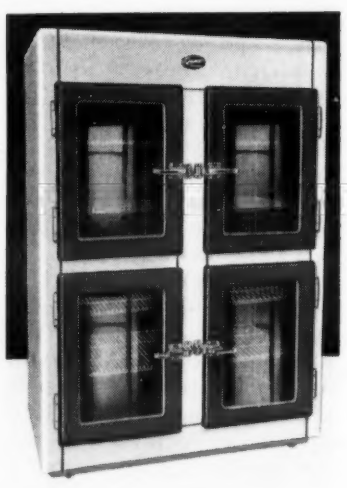
The problem here was to eliminate the coils from the box itself and to provide sufficient insulation.

(Concluded on next page)

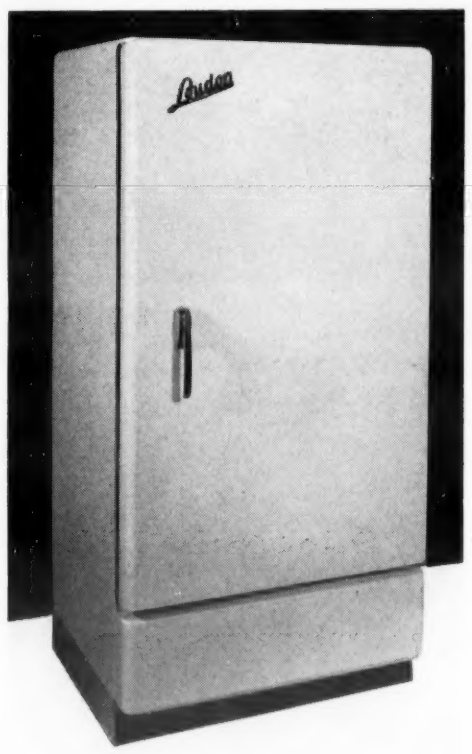
Meat Holding Room

Note overhead track which carries incoming meat from loading platform.

SELL THE LOUDON LINE



40 GR



Now available is this attractive 7 cu. ft. household refrigerator.

80 GR

Biological refrigerator

60 GR

Florist box

For the best in commercial refrigeration specify LOUDON. Models shown here available with glass or solid doors in white or black finish. Completely equipped with blower coil. Sizes from 40 cu. ft. to 80 cu. ft. We distribute FEDERAL Display Cases West of the Mississippi. For distributorship or dealership write us or see us at the Hotel Statler, during the Cleveland convention.

Loudon Sales, Inc.

2528 27th Ave. South, Minneapolis 6, Minn.

Manufacturers of bottle coolers—dough retarders—ice cube makers—milk coolers—home and farm freezers—walk-in coolers—reach-in coolers—biological refrigerators—household refrigerators—frozen food cabinets—florist boxes—meat display cases.

longer life...
Jarrow...
Refrigerator Door Gaskets Are Again Made From Crude Rubber
Always Demand These Quality Gaskets
JARROW PRODUCTS
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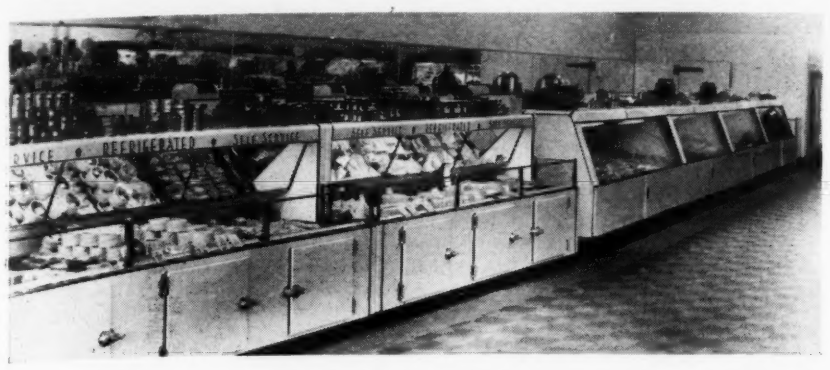


The two Hussmann cases (foreground) are powered by two ¾-hp. compressors. Refrigeration for the four Viking meat cases comes from a single 1½-hp. compressor.

* * *

2 Self-Serve, 4 Meat Cases Form Solid Bank of Refrigeration In Food Center

(Concluded from preceding page)

The first problem was solved by installation of an insulated blower box in the basement, with a squirrel cage booster fan to blow refrigerated air up into the box. Thus, the 128-cu. ft. capacity of the reach-in box is literally "air conditioned" to zero temperature, thereby eliminating the need for defrosting the box itself. A 1-hp. compressor is sufficient for this.

The second problem was solved by hanging ¾-in. thick Plexiglas doors for each compartment of the box inside the outer glass doors, with air space between the two doors. Though the Plexiglas inevitably fogs up somewhat, customers can still read the labels on the packages inside without difficulty, and sufficient insulation is also provided.

Replacement stocks of frozen foods are held in the 6 x 8-ft. frozen foods holding room, with access through the warmer temperature 6 x 12-ft. vegetable holding room. One 1½-hp. compressor holds both rooms at the desired temperatures.

Installation was made by the Shook Refrigeration Co. of Kirkland, Wash.

Insulin-Bearing Animal Glands Frozen To Keep Serum at Full Strength

OMAHA, Neb.—Demand for the pancreases of slaughtered animals to produce life-saving insulin has risen to a new all-time peak and as a result packers in this city, second largest meat packing center in the country, are using refrigeration as a precaution to save every pancreatic gland possible.

To be saved, the glands must be removed from the carcass before it has lost much of its body heat, and then must be kept in a frozen state in order to hold their insulin strength.

Several Omaha packers are sending the pancreases to the Omaha Cold Storage Co. which now is shipping about two carloads a month. An official of the Cudahy Packing Co.'s Omaha plant said the glands are being given special refrigeration space and attention, with a 30,000-lb. carload being shipped every six weeks. A spokesman at Armour & Co. said production of pancreases has been in full swing for several years.

Omaha packers get an average pound of beef pancreases for every two and one-half animals slaughtered; one pound for every six or eight hogs; one pound for every 12 to 16 calves, a spokesman for one packing company said workmen on the killing floors take a greater interest in the saving of the glands when they fully understand their importance.

Pharmaceutical manufacturers are pressed by a steadily mounting demand for insulin, and the American Meat Institute has issued an appeal to the smaller packers to install the refrigeration equipment and hire technicians needed to save the pancreases from the animals which they have slaughtered.

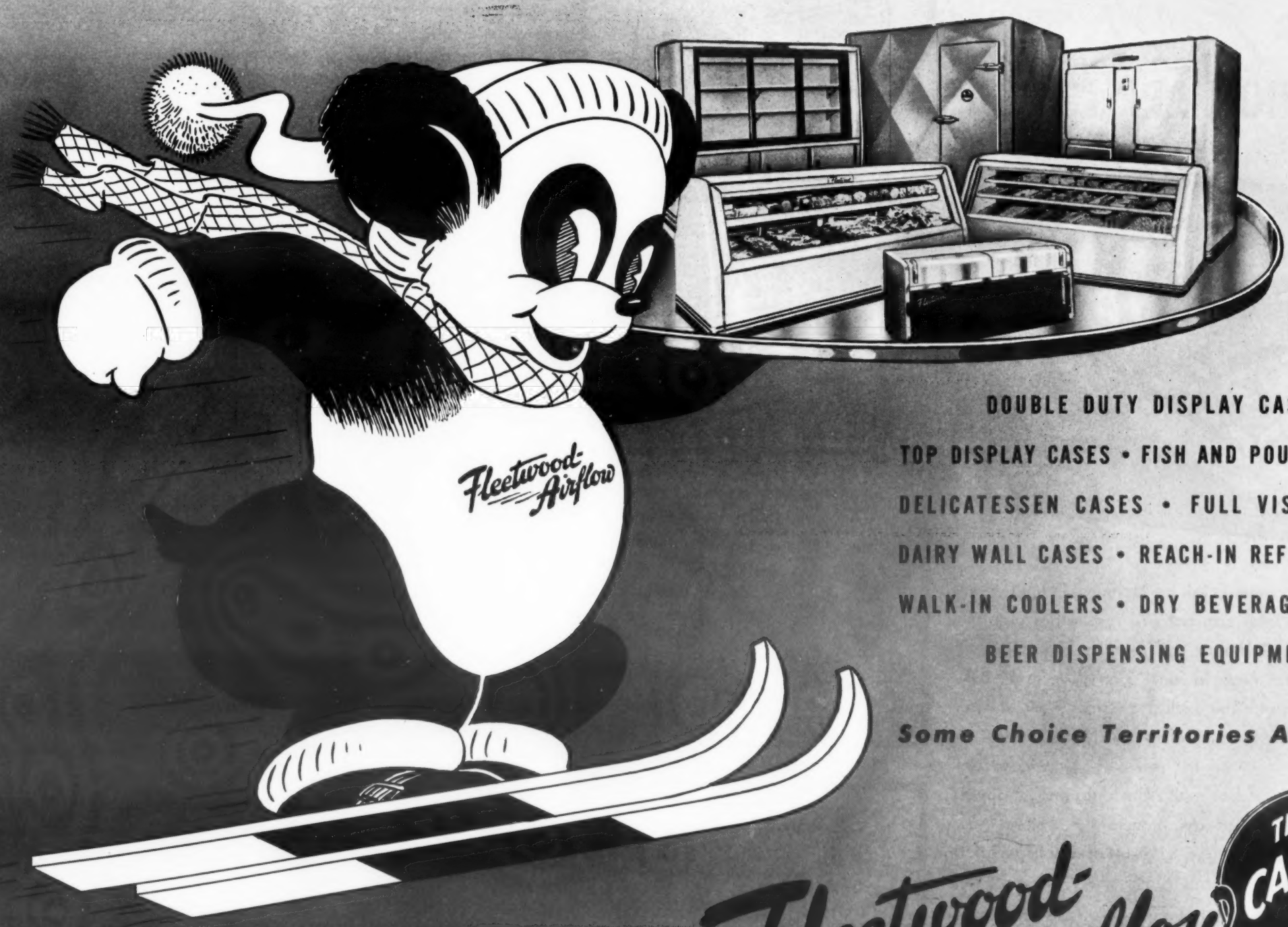
An alarming rise in the number of diabetic persons was noted last fall in a survey made by Drs. Hugh L. C. Wilkerson and Leo P. Krail in Ozord, Mass., when it was found that for every four cases diagnosed there were three unsuspected cases of diabetes. An estimated 1,000,000 diabetic sufferers require an uninterrupted supply of insulin in this country.

Refrigerator Holds $3,000 In Biologicals

This view shows the stock department at the Barth drug store in Lincoln, Neb., which during recent years has built up a large animal health business. Prominently located refrigerator generally contains some $3,000 worth of 45° biologicals for animals.

Serving Modern Merchandisers with the Best in

REFRIGERATED DISPLAY EQUIPMENT



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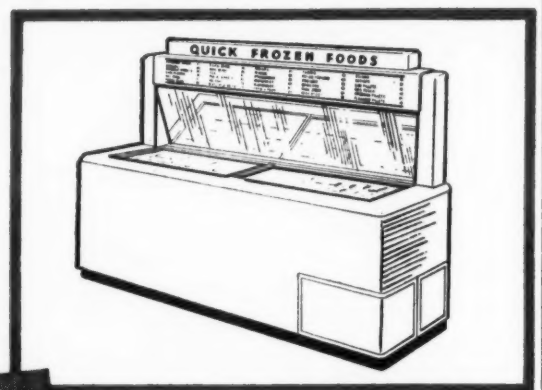

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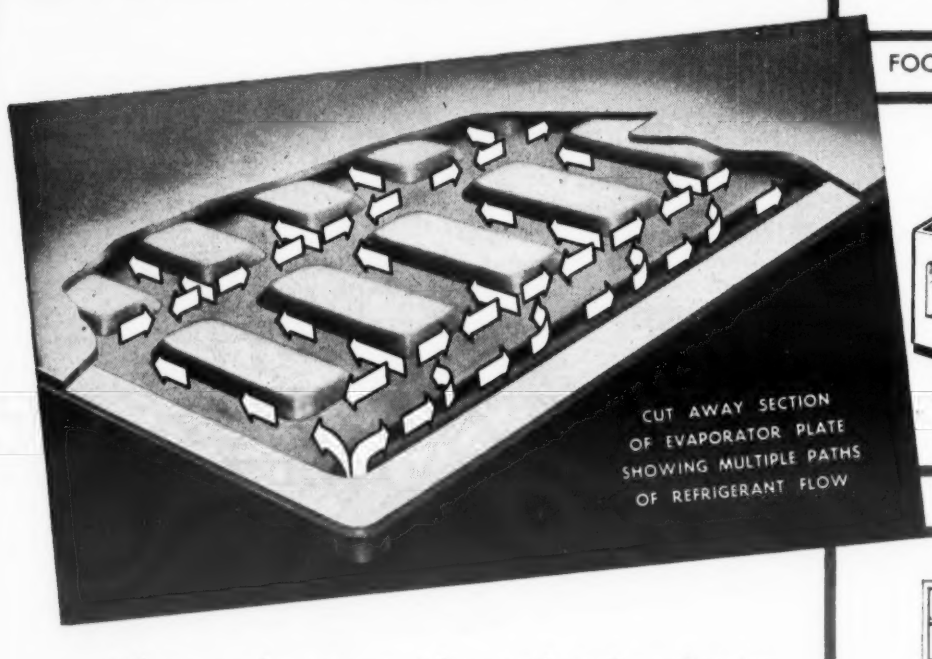

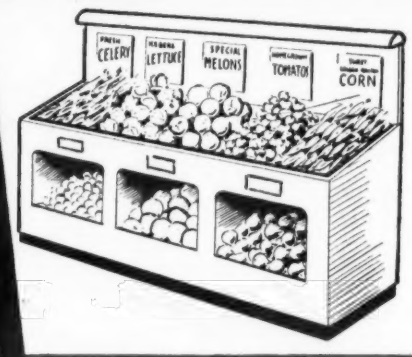

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AIR CONDITIONING AND REFRIGERATION News

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A 'Lost Generation' Must Be Taught How To Sell

APPLIANCE distributors are not the only merchandisers who are aware of the urgent need for more effective retail selling.

It seems that the nation's department store people are mightily disturbed about the current widespread inefficiency and indifference of their wartime-acquired clerks. They do not seem agreed on who or what is to blame for this condition, but they do agree that something must be done about it. And many of them are doing it.

What they are doing is reminiscent of the four principles for producing top salesmen which the dynamic Arthur H. (Red) Motley, president of Parade Publication, has expounded in recent speeches:

"Recruit more young men, select 'em better, train 'em better, and indoctrinate 'em."

For example, the objective of the training program recently installed in a Chicago department store can be summed up as: "Less people but better trained and more carefully selected." This store is concentrating on the education of its sales supervisors, with the hope that their "learning" will be passed on down the line.

Out in Los Angeles, the whole staff of one large department store is going to school. All employes, whether or not they actually sell, are studying salesmanship on company time.

Most department stores would probably go a lot further with their sales training programs if it were not for the continuing shortage of help. While some have declared that they plan to hire more suitable employes, others feel they had better try to retrain those they have, inefficient as they may now be.

An increasing number of department stores are making use of a fancy-sounding thing called "job evaluation-analysis" as a partial solution to their personnel problem. The title of this "gimmick" is a more impressive way of saying that those who hire salespeople should know what each job calls for, and then give that job to the person who is best qualified to handle it. (That's easier said than done.)

However, department stores not only are trying to pick the right man for the right job, along with training and retraining all personnel from the top-down—but they are studying other interesting innovations, such as standards for measuring "sales productivity." Sales production standards, it can be pointed out, form a new approach to retailing.

"We're trying to find out what our sales personnel did in 1941 and what they are doing today," one department store executive tells us. "In tabulating this sort of thing, we learn how many sales checks an operator is adding now as against prewar. Or how many customers a salesgirl waits on now compared with 1941. We're not depending on dollar comparisons, but on unit-of-work comparisons."

Testimony as to why department store folk are so efficiency-conscious these days came out when personnel and store management executives got together at the last meeting of the National Retail Dry Goods Association.

"The selling curve is now leveling out, expenses are going up, and the bosses are hammering their desks," remarked a delegate. "It's imperative that stores restore efficiency and cut operating costs. Now the handwriting is on the wall and it's getting to be almost a matter of survival."

Dronish clerks are losing 16 to 20% of the potential sales in his store, another retailer volunteered.

"They got into bad habits during the war," he observed. "But we could sell anything then. Now the buyer is setting the pace and he doesn't have to stand being pushed around anymore."

Still another admitted that half his staff ought to be fired because "they don't want to work" and "they're almost untrainable." A store survey showed that his clerks keep customers waiting from eight to 23 minutes, he added. It was even predicted by one executive that unless department stores start showing their customers some prewar service, a lot of them are not going to be around long.

And that's probably right.

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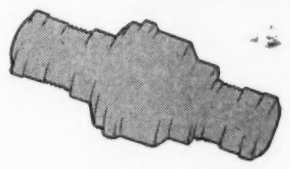
BOOTH No. 504

Be *sure* to see and inspect the many new A-P developments in DEPENDABLE Refrigeration Valves . . . including a new CHECK VALVE  . . . a new WATER REGULATING Valve new *larger capacity* AUTOMATIC Expansion Valve . . . new PRESSURE LIMITING Thermostatic Expansion Valves and other important advances in refrigerant control.

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'Columbus Pre-packaging Experiment' Reveals Less Waste, Increased Shelf Life and Pay Loads

By Chas. W. Hauck, The Ohio State University and Ohio Agricultural Experiment Station*

Much Food Wasted

Food wastes, arising from damage and spoilage losses in distribution, are a matter of great concern both to the general public and to the industries that produce and market these products. It is shocking to find authorities agreeing that about one-fourth of the food we produce never is converted into human nourishment but is discarded or wasted somewhere along the line—on farms, in packing houses, in processing, in transportation and storage, in wholesale warehouses, in retail stores, in the homes of consumers and in public eating places.

In view of a world scarcity of food, these estimates are unusually staggering and provocative. Then, too, inasmuch as food that is salable and usable has to bear not only its own costs but also all costs and losses associated with these wastes, lower costs of distribution may be expected to follow if wastes are reduced. Challenging re-examination of conventional practices at all points is called for to determine wherein these contribute to waste needlessly and which of them may be effectively modified and improved.

*From a paper presented at the annual meeting of the American Farm Economic Association.

Research and Business Team Seeks to Reduce Waste

In hope of reducing wastes and losses in the distribution of fresh fruits and vegetables, and with the further purposes of turning some of these items to self-service and bringing to city consumers fresh products in vine-ripened or tree-ripened stages or at the optimum degree of succulence and palatability, the Ohio Agricultural Experiment Station early in 1945 entered into a contractual arrangement with the Great Atlantic and Pacific Tea Co., whereby the wholesale and retail produce operations of the company in Columbus were thrown open to study and controlled experimentation.

The company has helped to finance the project by an annual grant-in-aid to the station. The contract has twice been renewed and is now in its third year.

This joint venture has provided opportunity to carry on the desired market research in a commercial atmosphere. The studies are being conducted in realistic surroundings. An attempt is made to come to grips with genuine over-the-counter marketing problems in the market place instead of under more or less artificial or simulated conditions in the laboratory.

Though the prime purpose of the research is to lower wastes and spoilage and to prolong the original fresh palatable quality of the produce, the more spectacular and conspicuous phases having to do with pre-packaging in consumer units have caused the project to be known popularly as "The Columbus Prepackaging Experiment."

Pre-Packaging Emphasized

"Pre-packaging" has certain descriptive weaknesses, but has come to be accepted as identifying the process whereby fresh fruits and vegetables are prepared for retail self-service.

This two-fold process

(1) subjects the produce to whatever sorting, washing and trimming may be necessary to prepare it partly or completely for kitchen or table use, and then

(2) transforms it, either with or without pre-cooling and refrigeration, into self-service items by packaging in pre-priced, labeled, closed, usually transparent containers, each holding a customary consumer unit (a pound of snap beans or tomatoes, a bunch or two of topped carrots, a head of cauliflower, etc.)

Facilities of the company in Columbus are serving as a sort of pilot plant. In the main, the merchandise is received at the warehouse in the usual way from local and distant sources packed in conventional shipping containers—baskets, hampers, crates, and the like.

A mechanized, air-conditioned packing room and a cold storage room have been set up in the warehouse and here the produce is removed from the original containers and is pre-packaged in shallow paperboard trays or paper U-boards or transaparent bags. The bags then are sealed by hand and the trays and U-boards are over-wrapped and sealed in moisture-proof transparent film by machine. Each package is automatically labeled, coded with the packing date, and marked with weight and price and then sealed.

The produce then is stored briefly at 40-45° F. while awaiting shipment to the retail stores.

The retail produce departments in the company's Columbus supermarkets have been equipped with open-top self-service type mechanically refrigerated sales and display cases, and these are stocked with pre-packaged consumer units.

Temperature in the display compartments of these cases (despite their open tops) is usually maintained at about 40-43° F. Reserve stocks of packaged goods are held at 37-40° F. in large storage chambers in the base of the cabinets.

Only attention required is for the retail attendants to keep the displays neatly arranged and to replenish them occasionally from the reserve stock, seeing that produce moves in the order in which it was packed.

The commercial facilities thus made available obviously could not have been reproduced by the Station for independent investigations. The research talents and technical training and equipment required were not to be found within the ranks of the company. So a partnership was created for the special purpose of attacking these related and important problems. Each party contributed something of its stock in trade, not the least of which is the prestige attached to its special position.

The Station has insisted that the results must be released to the public. This was readily agreed to by the company, thus insuring that any beneficial findings would be accessible to all and expediting their widespread application. Business competitors and much of the general public have continuously demonstrated an alert interest in what is going on, and to the credit of the company all have been welcomed impartially not only in the stores but also in the packing room.

As promptly as possible results have been published by the Station. Beginning with the May-June, 1946 issue of its Bi-monthly Bulletin, now known as Farm and Home Research, reports of some phase of this research have appeared in almost every issue.

Following are some of the more significant results of this experimental activity:

Wastes Reduced

Retail spoilage and damage losses have been sharply reduced by pre-packaging and refrigeration. Comparisons of selected commodities were made in 1946 and 1947 between conventional bulk goods in open counters, not refrigerated, and identical items packaged in sealed, transparent consumer units and displayed in refrigerated sales cases.

On six commodities—carrots, cauliflower, celery, sweet corn, head lettuce, and tomatoes—retail losses in 1946 were 17.3%, by weight, for conventional bulk handling as against only 1.8% for pre-packaged display.

Repeated in 1947, these losses were 17.7% and 1.5% respectively.

Aggregate losses recorded on 31 fresh fruits and vegetables in 1947 amounted to 8.2% when handled in bulk without refrigeration as against 1.8% when pre-packaged and refrigerated.

How much of this gain was due to pre-packaging and how much to refrigeration is not known, but experience has demonstrated that best results were attained with a combination of both.

Refrigeration retarded ripening and deterioration; sealed transparent wrappers aided in prolonging shelf life and protected the food from shriveling and weight loss due to dehydration and from physical damage caused by handling. Pre-packaging also contributed to sanitation and to merchandising advantages of brand identification, pre-weighing and pricing, and self-service.

Trimmings and damaged foods discarded in the pre-packaging process amounting to about one-fourth of the gross weight of produce received had little bearing on the comparison. Amounts disposed of in that process were mainly excess leaves, tops, husks, and stems left to protect the goods in shipment, inedible parts that otherwise would have been removed by the retailer in the course of conditioning the produce for display or by the consumer after purchase. Removal of these parts made no change in the number of salable

(Continued on next page)

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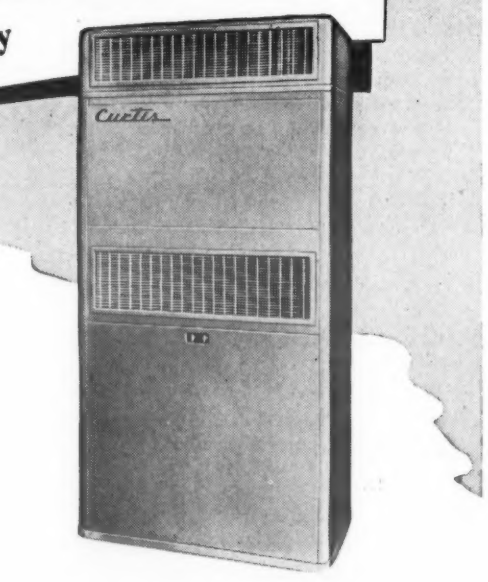

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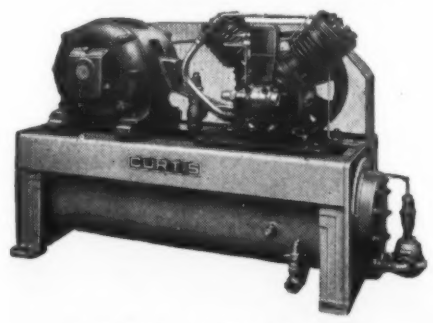

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Refrigeration, Pre-packaging Combine To Preserve Perishables 7 Times Longer

(Continued from preceding page)

units or in the quantity of edible food.

Pre-packaging may be viewed as a processing operation, in that the character or form of the product was changed in the process of converting the goods into self-service units. Trimmings disposed of in this operation cannot be considered in the same category as losses in bulk goods through trimmings and loss incurred by reconditioning while awaiting sale in the retail store, or eventual complete loss after repeated examination and rejection by patrons.

Pre-packaging did not create or increase waste; it only localized existing waste which bulk merchandising would have revealed at later stages —retail store and consumer's kitchen. The process may be credited with very real reductions of waste.

Shelf Life Prolonged

Retailers of fresh fruits and vegetables have a vital interest in what is known in trade parlance as the "shelf life" of the perishables they handle. Success or failure in the retail produce department is largely dependent upon the shelf life of the goods offered. The term may be defined as the period of time during which the merchandise after being received in the store remains fresh, attractive, and sufficiently appealing to patrons as to be readily salable without price reductions.

Interest of the retailer in shelf life arises from the close relationship it bears to his alternatives of (1) profits from a rapid turnover rate and large volume resulting from repeat sales to satisfied customers or (2) losses from reconditioning, price reductions, and disposal of part of his purchases in the form of garbage rather than by way of the cash register.

He is fully aware that his margin of safety is narrow with soft fruits, leafy vegetables and others, and that potential profits may quickly change to losses, often through circumstances beyond his control.

In the hope of avoiding losses, he may limit his offerings to insufficient amounts or may confine his purchases to the less perishable items, or he may too long delay needed trimming or reconditioning and price reduction. Inevitably, this course can only result eventually in loss of trade. More wisely, he can adopt measures to speed his turnover rate and to increase his margin of safety through lengthened shelf life.

However indifferent producers and consumers may be to this very critical problem of the distributor, nevertheless the problem is theirs also. It directly or indirectly affects their welfare. The cost, quality and variety of offerings available to consumers and quantities sold and prices received by producers are determined to a considerable extent by the manner in which the distributor conducts his business.

To lengthen shelf life is to lower losses. Reduced losses are a matter of general concern. Accordingly tests were run in 1946 and 1947 to contrast the shelf life of representative items both in bulk and in sealed consumer units, when held under room conditions, exposed on beds of cracked ice, and mechanically refrigerated.

The 1946 tests included 14 commodities—root crops, green and leafy vegetables, citrus and deciduous fruits. The 1947 tests covered snap beans, broccoli, cauliflower, celery, endive, head lettuce, and green peppers.

On the whole, mechanical refrigeration alone helped greatly in maintaining the salable weight and lengthening shelf life. Results obtained by pre-packaging alone were about the same as with refrigeration alone in terms of lengthened shelf life and substantially better than with refrigeration alone in terms of maintaining salable weight.

Packaging and mechanical refrigeration together retained the perishables within 95% of the original weight for periods ranging from six to 24 days; or in other words, from two to seven times longer than any of the other treatments. This combination of factors extended the shelf life of all the products tested much more than any other combination tried in these tests. Sharing a second position were pre-packaged produce refrigerated with cracked ice and bulk produce under mechanical refrigeration.

'Pay Loads' Can Be Increased

Opportunities seem abundant for increasing pay loads in the shipment of some fresh vegetables by reducing tare weights and removing more of the inedible portions before packing and shipment. The project has no achievement to its credit in this direction beyond the accumulation of data disclosing some of these opportunities to reduce excess shipping weights.

During a two-month period representative sample shipping containers were selected at frequent intervals from arrivals of 27 fruits and vegetables. Each was weighed and unpacked to determine its gross shipping weight, tare weight, weight of salable contents, and (in the case of pre-packaged items) the weights of trimmings and discarded damaged produce.

Of the 16 commodities subjected to pre-packaging, salable contents after trimming ready for kitchen or table use comprised, on the average, 71% of the gross weight when received at the wholesale warehouse. Tare weights averaged 14% and weight losses due to trimming and damage from decay, shriveling, mechanical means and other causes averaged 15%.

Cabbage, citrus fruits, dry onions, and potatoes in bags showed tare weights of less than 1%, that is, over 99 pounds of produce were carried by less than one pound of package. At the other extreme, shallots or green onions in iced barrels required 41 pounds of package and packing materials to move 59 pounds of produce.

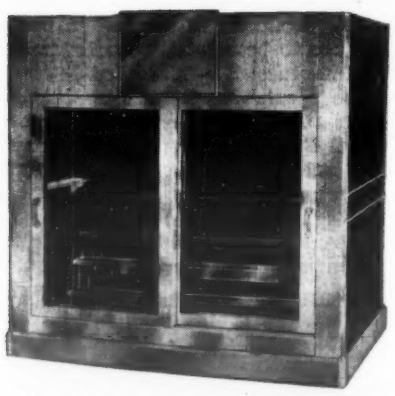
Head lettuce serves as an example. From western sources it comes to market practically the year-round, packed in crates holding on the average some five dozen heads with snow ice between the layers of heads in the crates and weighing about 90 pounds per crate. Of this gross amount the crate, liner, and ice (after arrival), or tare weight, averaged over 19 pounds or more than 21%. The loss from trim and damage in preparing the lettuce for retail display averaged almost an identical amount, or another 21%.

(Continued on next page)

Experiment Going on Here

Shopper selects ready-for-the-table pre-packaged produce from a refrigerated self-serve display case in one of the Columbus outlets of the Great Atlantic & Pacific Tea Co., which is cooperating in the "Columbus Experiment," being conducted jointly by the company and the Ohio Agricultural Experiment Station.

IT'S "Character" FOR SALES



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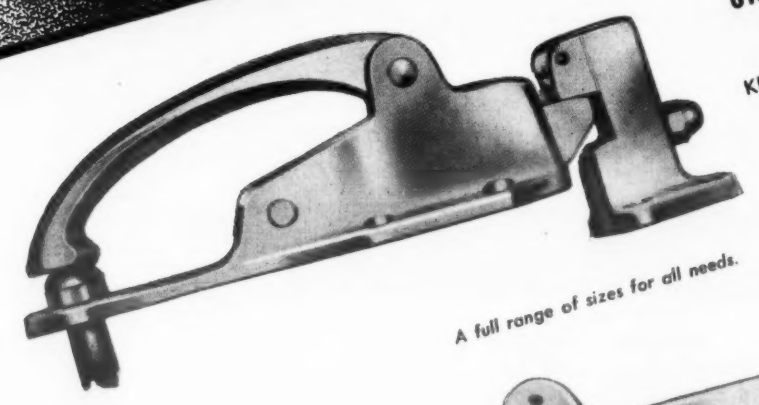

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FINISH: CADMIUM
WEIGHT: 10 LBS.

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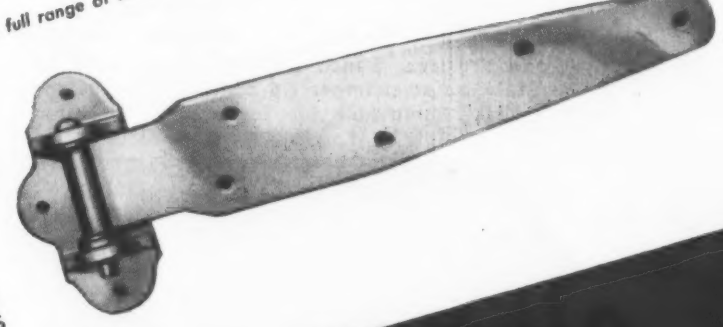

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BALL BEARING
FINISH: CADMIUM
WEIGHT: 16¼ LBS. PER PAIR
OTHER SIZES FOR ALL NEEDS

Good hardware — smart in appearance, as efficient and durable as it is good looking.

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Extra Customer Satisfaction Costs Dealer Nothing, Columbus Expense Records Indicate

(Continued from preceding page)

The balance was salable lettuce. It weighed a little over 52 pounds or slightly less than 58% of the gross shipping weight. Obviously the entire cost of handling and distributing the lettuce had to be borne by approximately 58 pounds of each 100 pounds gross shipping weight, or in other terms, by 73 pounds of each 100 pounds of lettuce shipped.

Any improvement should be welcome that would reduce shipping weights to more nearly the weight of salable goods. Measures that lessen the need for bulky protective packaging and at the same time prolong the original quality and condition of the merchandise would be reflected in higher pay loads. That is, if the retailer did not have to throw out as waste any considerable part of what he pays for, if practically every pound of fresh fruits and vegetables delivered to him were salable and usable, his costs and profits could be distributed over the entire amount instead of having the burden carried by 50, 70, or 90% of the lot.

Transportation and handling expenses would be lower. Kitchen drudgery and garbage problems of the consumer would be simplified, and waste disposal services could be performed by the community for less cost.

Approved by Consumers

Ready consumer acceptance of prepackaged, refrigerated produce has been very encouraging. In certain retail stores results have been spectacular, both sales volume and net profits having risen after conversion from bulk retailing.

Over-all dollars and cents results have been such that the company already has expanded the operation from one store in 1945 to all 10 of its stores in Columbus and two outside Columbus, and is now in the process of greatly enlarging and improving and further mechanizing its pre-packaging facilities, and transferring them to a newly acquired building where they will occupy more than 10 times as much floor space.

When this has been accomplished, pre-packaged produce will be offered in all stores of this unit, almost 100, just as rapidly as they can be equipped with refrigerated cases.

In the meantime costs and returns have been subjected to continuous examination by means of a quarterly comparison of sales and expense records of the 10 Columbus stores against 10 other stores of this unit outside Columbus handling produce in the conventional bulk manner.

Despite no increase in prices to consumers, savings and increased sales volume associated with prepackaged produce have more than paid the added costs. Yet cramped quarters and the resulting inefficient operation in the packing room to date prompt the belief that unit costs will be lowered after the expansion is completed.

Greater consumer satisfaction inspired by pre-packaging and more sales volume at lower unit costs may mean eventually lower rather than higher retail prices. The retailer's costs and profits are extremely sensitive to any measure that permits them to be distributed over a larger portion of the produce he purchases, by reducing the amounts going out the back door as garbage.

Some Pre-Packing Done at Shipping Points

Pre-packers are springing up all over the United States. Some are new, others are established concerns that are modifying their operations to include pre-packaging. Some are located at points of origin, near the fields where the produce grows. Mostly, for the present at least, they are in terminal markets near the retail stores and the consumers who use the goods.

Among those pioneers are independent and cooperative groups of growers, shippers, jobbers, and service wholesalers, chain and independent retailers, and specialized packing companies. Much experimenting is going on.

Opinions differ as to whether it is to be eventually a function of the shipper or receiver, and only time and experience can settle the question. Probably no one doubts the commercial practicability of packing so-called "hardware" items such as apples, potatoes, citrus fruits, and dry onions in consumer units at distant sources. It has been going on for a long time. Technological advances already a reality or in sight may ultimately permit equal success with more perishable produce.

But for the present, in order to insure freshness and good quality in pre-packaged retail displays, it is necessary to trim and pre-package most goods after arrival in terminal wholesale and jobbing markets, and with some highly perishable items the necessity for a last look even requires a minor amount of pre-packaging by the retailer.

The development in Columbus to date is predicated upon the belief that for some time the final sorting and preparation and packaging will have to be done for the most part just before the goods go to retail. The company's investments in the venture are guided by that conviction.

Yet other suppliers are being encouraged to furnish as much as they can. A few items in limited quantities are being received in acceptable form and condition from time to time from both local and distant shippers. Ohio growers have supplied some pre-packaged apples, peaches, radishes, carrots, and sweet corn. West Virginia growers have shipped some pre-packaged broccoli and cauliflower. Packers in Columbus and other nearby cities have furnished some pre-packaged spinach, tomatoes, and cut vegetable salad combinations.

Experimental shipments of strawberries from Tennessee and peaches from South Carolina have been made to Columbus, and arrangements have been made for trial shipments of vegetables from Florida and California.

Teamwork Needed With Industry

All these shipments move through the usual commercial channels. The company's representatives negotiate for the merchandise and handle the accounting at both ends of the line in the customary way. In some cases, however, in addition to the shipper, the company and the Ohio Station, still a fourth party has a hand in the transaction—the Agricultural Experiment Station in the State of origin. The experimental features of the shipments require supervision and control by trained research workers at origin as well as at destination. This introduces another very important aspect of the teamwork involved in the project.

If delivery of prepackaged perishables in good condition from distant points of production can be assured, gains may be expected to arise from the use of lighter packages and savings in shipping weights and transportation costs due to trimming at the source. If these potential gains are to be realized, much further experimentation is indicated.

More research agencies need to be tied in at proper points. More commercial interests should take a hand —not only packers and distributors, but transportation agencies, and manufacturers and suppliers, of containers and packaging materials, mechanical equipment, refrigeration and

(Concluded on next page)

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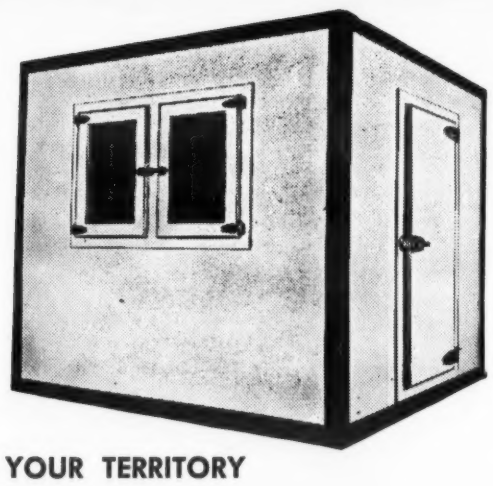

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FOUR FOOT CASE

1. Triple glass thermopane unit
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4. Two fin cooling coils
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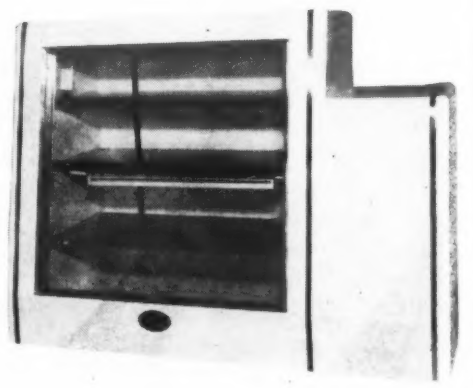

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Meat, Dairy Products Are Pre-packaged

Although not included in the "Columbus Experiment," meat and dairy products are currently being sold by dealers throughout the nation in pre-packaged style from refrigerated self-serve cases similar to the one above.

Research Must Be Continued To Answer Biological, Technological, Economic Problems

(Concluded from preceding page)

pre-cooling facilities, mold inhibitors and sanitation equipment and supplies, and others.

If the research is to be done effectively and economically, it should be closely integrated and directed, with appropriate contributions being made by each of the participating research agencies and commercial concerns.

Teamwork Needed Between Social and Physical Scientists

However encouraging results to date may be, there are hazards and pitfalls at many points that dare not be overlooked. Much remains to be learned about pre-packaging before this promising new industry can be said to have outgrown its infancy. Pre-packaging introduces some new and intricate unknowns.

Distribution of fresh fruits and vegetables by orthodox means is none too simple, but when these goods are sealed in closed consumer units new physiological and economic complexities arise. This conversion process calls for more than a wrapping machine and a stock of packaging supplies.

Problems associated with shipment and handling of such highly perishable items as tree-ripened peaches or husked milk-stage sweet corn apparently cannot be eliminated by consumer packaging alone. They are even increased. Living, respiring plants or parts of plants cannot be tightly sealed in unventilated containers without creating new problems calling for new solutions.

Questions that remain unanswered are manifold and varied. They may be catalogued roughly as biological, technological, or economic, but for the most part are so interrelated as to be practically incapable of segregation. The subject merits the attention of the economists, but it also is crying for study by the horticulturist, the biochemist, the engineer, and other specialists.

Separate isolated attacks upon selected fragments of the problem are not likely to yield results in any reasonable time. A more realistic and fruitful approach would be to bring the talents and facilities of both the social and physical scientists to bear on the matter by means of a broad and closely coordinated program of research, thus introducing another form of teamwork.

Qualified Research Agency Must Carry on Work

Experience with this co-called "Columbus Experiment" to date has convinced us that whatever the contribution of the cooperating commercial agency, in a joint program of this kind the investigations must be directed by a qualified research agency.

Though full consideration must be given to the commercial factors involved, nevertheless final decisions on problems to be explored and methods to be used must be made by competent, practical research personnel rather than by those whose first interest must lie in their commercial duties and responsibilities and whose training has been elsewhere than in the field of fact-finding.

Our experience has taught us also that we have no more than scratched the surface. Prospective social gains of much significance may be anticipated, provided the research is sufficiently comprehensive and imaginative, and provided the quarterbacking and the teamwork are good. Some gaps in the lineup need to be filled with a few of the brawny, skillful and eager players that so far have not been called in from the bench—industries with related interests, other state experiment stations, the U. S. Department of Agriculture, certain of the physical scientists.

New 'Sub-Zero Sealer' Is Designed To Keep Moisture Out of Refrigerated Equipment

LANCASTER, Pa. — A new improved sealer for use in the insulation of refrigerated equipment to keep vapor and moisture-laden air from the insulation space has been developed and placed on sale by the Armstrong Cork Co.

Called Armstrong's "Sub-Zero Sealer," the new product is resilient, moisture-and-vaporproof, and sufficiently pliable to resist normal impact and torque action.

The new sealer may be used in all-steel construction where it is poured along the welded seams and under the breaker strips. In combination wood and steel construction, it is poured along the joints where the wood and steel meet. A hot type sealer is considered essential for equipment operating at 0° and lower.

The new product has a melting point of 240 to 260° F. and a penetration of 77° F. of 65 and 75. At -10° F. a 1/16 in. film of Armstrong's sub-zero sealer on 30-pound kraft paper can be bent slowly around a 1 in. mandrel without cracking, it is claimed.

The new product will not flow when the finished equipment is made, stored, or shipped during high summer temperatures, and it will not crack where shipment or storage might be required where winter weather drops temperatures to -25° F.

The sub-zero sealer is odorless and can be used on food cabinets without any possibility of tainting.

Flathead Service Is Set Up In Montana

POLSON, Mont.—Flathead Electric Service has been incorporated at Polson with a capital stock of $50,000, to engage in the electrical appliance and electric service business. Incorporators are Theodore J. Berthelote, Howard E. Veneta, and Mabel M. Berthelote.

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Inquiries are invited . . . write for additional information on our sales and service plan.

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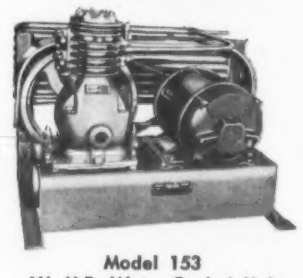
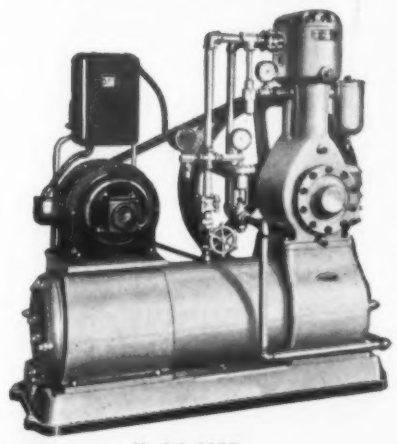
1½ H.P. Air-Cooled Unit



Model 153
1½ H.P. Water-Cooled Unit



Model 1110
10 H.P. Ammonia Unit

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Fans (Cont.)

SELECTION OF FANS

In order to illustrate how to select fans examples of fan capacity tables are shown in Figs. 8 and 9.

These capacity tables are but a few of many tables used by the American Blower Co. for selecting its fans.

The "Sirocco" fan as shown in Fig. 8, is the forward curve blade type fan, and the "High Speed" fan shown in Fig. 9 is the backward curve blade type fan.

Other manufacturers have their own and similar tables for selecting their fans. Use the tables of the manufacturer whose fans you are going to use.

The selection of all fans is based on standard air which is taken at 70° F. temperature and at zero elevation (sea level).

For altitudes from sea level to about 1,000 ft. and also for heating air to about 150° F., these same tables can be used with no corrections.

For altitudes above 1,000 ft. and also for heating air above 150° F. the same tables can be used but certain corrections must be made.

EXAMPLE NO. 1

Given: an office building system at an altitude of less than 1,000 ft., requiring 30,000 c.f.m. at 1.5 in. w.g. resistance pressure, the fan to handle air from 50° to 140° F. Select size of fan and motor required. Using (a) forward curve blade fan; (b) backward curve blade fan.

FORWARD CURVE BLADE FAN

Referring to Fig. 8 (it is best to compare at least three fans within the range) we obtain the data shown in Table 2.

The fan selected will have to fall in the range shown. From Table 1 the limits are 2,200 outlet velocity and 3,500 tip speed.

To determine the tip speed, multiply the circumference of the wheel by the revolutions per minute, or 12.73 ft. x 262 = 3,335 f.p.m.

From the above range the No. 486 fan would be the best selection as it falls within the limits. The No. 440

Capacity Tables for Forward Curve Blade Fan

440 SIROCCO FAN — SINGLE INLET SINGLE WIDTH

WHEEL { 44" diameter / 11.52 ft. circumference } INLET { 50" diameter Outside / Area 13.499 sq. ft. Inside }
OUTLET { 48¼" x 34⅞" Outside / Area 11.400 sq. ft. Inside } WHEEL PERIPHERAL VELOCITY 11.52 × R.P.M. = F.P.M.

CFM	Outlet Velocity	Outlet Velocity Pressure	¼" S.P. RPM	¼" S.P. BHP	¼" S.P. RP	1" S.P. P	1" S.P. RPM	1" S.P. BHP	1¼" S.P. RPM	1¼" S.P. BHP	1½" S.P. RPM	1½" S.P. BHP
9120	800	.040	116	.57	13	..	.....	.....	.....	.....	.....	.....
10260	900	.051	119	.66	14	..	.....	.....	.....	.....	.....	.....
11400	1000	.063	121	.81	14	..	.....	.....	.....	.....	.....	.....
12540	1100	.076	124	.96	14	..	.....	.....	.....	.....	.....	.....
13680	1200	.090	127	1.15	14	9	227	3.17	.....	.....	.....	.....
14820	1300	.106	130	1.36	15	9	228	3.47	254	4.24	.....	.....
15960	1400	.123	134	1.57	15	9	229	3.79	255	4.65	.....	.....
17100	1500	.141	139	1.87	15	4	231	4.15	256	5.03	279	5.93
18240	1600	.160	145	2.18	16	9	232	4.56	257	5.42	280	6.36
19380	1700	.181	151	2.57	16	0	234	4.98	258	5.89	281	6.87
20520	1800	.203	156	2.97	16	2	236	5.44	259	6.38	282	7.38
21660	1900	.226	163	3.38	17	1	239	5.95	261	6.89	283	8.01
22800	2000	.250	169	3.82	17	5	242	6.47	263	7.51	285	8.64
23940	2100	.276	174	4.33	18	0	245	7.05	267	8.14	287	9.28
25080	2200	.303	179	4.86	19	1	249	7.69	270	8.80	290	9.95
26220	2300	.331	185	5.42	19	7	251	8.35	273	9.47	293	10.64
27360	2400	.360	191	6.05	20	9	254	9.19	276	10.22	295	11.35
28500	2500	.391	196	6.71	20	1	257	10.05	279	11.01	299	12.24
29640	2600	.423	200	7.40	21	5	260	10.91	282	11.86	301	13.13
30780	2700	.456	205	8.17	22	5	264	11.79	285	12.77	304	14.12
31920	2800	.490	210	9.01	22	1	269	12.67	287	13.92	308	15.09

486 SIROCCO FAN — SINGLE INLET SINGLE WIDTH

WHEEL { 48⅝" diameter / 12.73 ft. circumference } INLET { 55⅜" diameter Outside / Area 16.574 sq. ft. Inside }
OUTLET { 53¼" x 38½" Outside / Area 13.910 sq. ft. Inside } WHEEL PERIPHERAL VELOCITY 12.73 × R.P.M. = F.P.M.

CFM	Outlet Velocity	Outlet Velocity Pressure	¼" S.P. RPM	¼" S.P. BHP	¼" S.P. RPM	P. HP	1" S.P. RPM	1" S.P. BHP	1¼" S.P. RPM	1¼" S.P. BHP	1½" S.P. RPM	1½" S.P. BHP
25038	1800	.203	141	3.63	15	6.00	214	6.64	235	7.78	256	9.01
26429	1900	.226	147	4.12	15	6.60	216	7.26	236	8.40	257	9.77
27820	2000	.250	152	4.67	16	7.26	219	7.89	238	9.17	258	10.54
29211	2100	.276	158	5.29	16	7.93	222	8.60	241	9.94	260	11.32
30602	2200	.303	162	5.92	17	8.68	225	9.39	244	10.74	262	12.14
31993	2300	.331	167	6.62	17	9.48	227	10.19	247	11.56	265	12.98

537 SIROCCO FAN — SINGLE INLET SINGLE WIDTH

WHEEL { 53¾" diameter / 14.07 ft. circumference } INLET { 59¼" diameter Outside / Area 18.986 sq. ft. Inside }
OUTLET { 58¾" x 42½" Outside / Area 16.980 sq. ft. Inside } WHEEL PERIPHERAL VELOCITY 14.07 × R.P.M. = F.P.M.

CFM	Outlet Velocity	Outlet Velocity Pressure	¼" S.P. RPM	¼" S.P. BHP	¼" S.P. RP	P. BHP	1" S.P. RPM	1" S.P. BHP	1¼" S.P. RPM	1¼" S.P. BHP	1½" S.P. RPM	1½" S.P. BHP
22087	1300	.106	107	2.03	12	5.61	187	5.16	208	6.32	.....	.....
23786	1400	.123	110	2.34	12	6.05	188	5.65	209	6.92	.....	.....
25485	1500	.141	114	2.78	12	6.57	189	6.19	210	7.50	229	8.84
27184	1600	.160	119	3.25	13	7.10	190	6.79	211	8.08	230	9.48
28883	1700	.181	123	3.83	13	7.70	192	7.41	212	8.77	231	10.24
30582	1800	.203	128	4.43	13	8.32	194	8.10	213	9.51	232	11.00
32281	1900	.226	133	5.03	14	9.06	196	8.86	214	10.26	233	11.93
33980	2000	.250	138	5.70	14	9.86	198	9.68	216	11.20	234	12.87

Fig. 8 shows portions of fan capacity tables for three sizes of a forward curve blade fan made by American Blower Corp.

fan is slightly small, while the No. 537 fan is slightly large.

The bhp. is 11 + 20% = 11 x 1.2 = 13.20 hp. motor.

The next commercial size motor is 15 hp. Therefore, the fan required is a No. 486 single inlet single width fan and a 15-hp. motor.

BACKWARD CURVE BLADE FAN

Referring to Fig. 9 we obtain the data shown in Table 3.

The fan to be selected will fall in the range shown. From Table 1 the limits are 2,200 outlet velocity and 7,500 tip speed.

To find tip speed, multiply the circumference of the wheel by the revolutions per minute or 12.73 ft. x 535 = 6,811 f.p.m.

From the above range the best selection would be the No. 486 fan, as both the outlet velocity and tip speeds are within the recommended limits. The No. 440 fan would be

(Continued on next page)

Table 2—Comparative Data on 3 Sizes of Fans

	No. 440 Fan	*No. 486 Fan*	*No. 537 Fan*
Static pressure	1.5 in.	1.5 in.	1.5 in.
C.f.m.	30,780	30,602	30,582
Outlet velocity	2,700 f.p.m.	2,200 f.p.m.	1,800 f.p.m.
Tip speed	3,502 f.p.m.	3,335 f.p.m.	3,264 f.p.m.
R.p.m.	304	262	232
Brake hp.	14.12	12.14	11.00

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Capacity Tables for Backward Curve Blade Fan

440 AMERICAN HS FAN SINGLE INLET SINGLE WIDTH

WHEEL { 44" diameter / 11.52 ft. circumference — INLET { 50" diameter outside / Area 13.499 sq. ft. inside

OUTLET { 48¼" x 34⅞" outside / Area 11.400 sq. ft. inside — WHEEL PERIPHERAL VELOCITY 11.52 × R.P.M. = F.P.M.

CFM	Outlet Velocity	Outlet Velocity Pressure	¼" S.P. RPM	¼" S.P. BHP	3/ RPM	HP	1" S.P. RPM	1" S.P. BHP	1¼" S.P. RPM	1¼" S.P. BHP	1½" S.P. RPM	1½" S.P. BHP
26220	2300	.331	503	5.27	518	.47	570	8.10	590	9.08	606	10.02
27360	2400	.360	524	5.89	538	.20	589	8.81	608	9.82	622	10.85
28500	2500	.391	544	6.54	558	.17	607	9.64	627	10 65	636	11.67
29640	2600	.423	564	7.29	578	.16	626	10.46	645	11.59	651	12.62
30780	2700	.456	585	8.04	598	.13	644	11.43	663	12.53	667	13.58
31920	2800	.490	605	8.78	618	.12	663	12.40	681	13.48	686	14.55

486 AMERICAN HS FAN SINGLE INLET SINGLE WIDTH

WHEEL { 48⅜" diameter / 12.73 ft. circumference — INLET { 55⅜" diameter outside / Area 16.574 sq. ft. inside

OUTLET { 53¼" x 38½" outside / Area 13.910 sq. ft. inside — WHEEL PERIPHERAL VELOCITY 12.73 × R.P.M. = F.P.M.

CFM	Outlet Velocity	Outlet Velocity Pressure	¼" S.P. RPM	¼" S.P. BHP	3/ RPM	P	1" S.P. RPM	1" S.P. BHP	1¼" S.P. RPM	1¼" S.P. BHP	1½" S.P. RPM	1½" S.P. BHP
25038	1800	.203	365	3.43	378	67	437	6.20	459	7.22	480	8.31
26429	1900	.226	381	3.92	397	27	451	6.84	471	7.89	494	8.97
27820	2000	.250	400	4.48	414	87	466	7.47	484	8.53	508	9.72
29211	2100	.276	418	5.09	432	47	482	8.24	500	9.30	521	10.56
30602	2200	.303	437	5.71	451	20	500	9.02	517	10.19	535	11.39
31993	2300	.331	455	6.44	468	12	516	9.88	534	11.08	548	12.23

537 AMERICAN HS FAN SINGLE INLET SINGLE WIDTH

WHEEL { 53¾" diameter / 14.07 ft. circumference — INLET { 59¼" diameter outside / Area 18.986 sq. ft. inside

OUTLET { 58¾" x 42½" outside / Area 16.980 sq. ft. inside — WHEEL PERIPHERAL VELOCITY 14.07 × R.P.M. = F.P.M.

CFM	Outlet Velocity	Outlet Velocity Pressure	¼" S.P. RPM	¼" S.P. BHP	3/ RPM	P	1" S.P. RPM	1" S.P. BHP	1¼" S.P. RPM	1¼" S.P. BHP	1½" S.P. RPM	1½" S.P. BHP
22087	1300	.106	257	1.96	27	1	338	4.67	363	5.76	....	.....
23786	1400	.123	271	2.32	28	5	348	5.12	371	6.28	.....	.....
25485	1500	.141	287	2.69	29	0	358	5.68	382	6.86	406	7.97
27184	1600	.160	300	3.14	31	5	369	6.23	393	7.48	415	8.61
28883	1700	.181	315	3.63	32	9	382	6.90	405	8.08	423	9.33
30582	1800	.203	330	4.18	34	2	395	7.57	415	8.81	435	10.15
32281	1900	.226	345	4.79	35	6	409	8.35	427	9.64	448	10.95
33980	2000	.250	362	5.48	37	9	422	9.13	438	10.42	460	11.86

Fig. 9 shows portions of fan capacity tables for three sizes of a backward curve blade fan made by American Blower Corp.

* * *

Selecting Fans--

(Continued from preceding page)

slightly small, but in some cases would be all right. The No. 537 fan is slightly large. The best selection is the No. 486 fan.

In selecting the motor for this type of fan, we must consider the non-overloading characteristic, which will require the use of the formula at the top of the capacity table.

$$\text{Max. bhp.} = 75.80 \times \left[\frac{\text{r.p.m.}}{1{,}000}\right]^3$$

$$\text{Max. bhp.} = 75.80 \times \left[\frac{535}{1{,}000}\right]^3$$

Max. bhp. =
75.80 x .153 = 11.60
11.60 + 20% =
11.60 x 1.2 = 13.92-hp. motor

The next commercial size motor is 15 hp. Therefore, the fan required is a No. 486 fan and a 15-hp. motor.

FAN LAWS

Certain fundamental laws apply to the performance of all fans:

1. The fan capacity varies directly as the speed.
2. The pressure varies as the square of the speed.
3. The power varies as the cube of the speed.

EXAMPLE NO. 2

Suppose we have installed the fan called for in the previous example, and the internal load of the space has been increased. To meet this change in load the air to be supplied must be increased to 35,000 c.f.m. and must be delivered by the same fan.

What will be the new resistance pressure and motor power (using the backward curve blade fan figures)?

$$\text{Speed} = 535 \times \left[\frac{35{,}000 \text{ c.f.m.}}{30{,}602 \text{ c.f.m.}}\right] = 610 \text{ r.p.m.}$$

$$\text{Power} = 11.60 \times \left[\frac{610}{535}\right]^3 = 17.16 \text{ bhp. x } 1.2 = 20.59\text{-hp. motor}$$

$$\text{Static Pressure} = 1.5 \times \left[\frac{610}{535}\right]^2 = 1.95 \text{ in. w.g.}$$

Therefore, in this change the static pressure becomes 1.95 in. w.g., the new speed of the fan will be 610 r.p.m., and the motor has to be changed from a 15 to 20-hp. motor.

EXAMPLE NO. 3
CORRECTION FOR ALTITUDE

Suppose the fan in Example No. 1 is to be selected for an altitude of 5,000 ft. It will be necessary to correct the fan performance to a sea-level basis (29.92 in. barometer).

As the fan tables are based on air at sea level, we will have to reduce the resistance pressure to a sea level basis.

The density of the air at 5,000 ft. altitude is .826.

The resistance pressure of fan in Example No. 1 is 1.5 in. w.g.

Therefore:

$$\frac{1.5 \text{ in. w.g.}}{.826} = 1.816 \text{ in. w.g.}$$

If we wanted a backward curve blade fan, we refer to the fan tables and find the following fan should be used:

No. 486, single width single inlet, 30,602 c.f.m., 1¾ in. w.g. static pressure, 553 r.p.m., 12.67 bhp., using a 15-hp. motor.

(To Be Continued)

Table 3—Comparative Data on 3 Sizes of Fans

	No. 440 Fan	*No. 486 Fan*	*No. 537 Fan*
Static pressure	1.5 in.	1.5 in.	1.5 in.
C.f.m.	30,780	30,602	30,582
Outlet velocity	2,700 f.p.m.	2,200 f.p.m.	1,800 f.p.m.
Tip speed	7,684 f.p.m.	6,811 f.p.m.	6,123 f.p.m.
R.p.m.	667	535	435
Brake hp.	13.58	11.39	10.15

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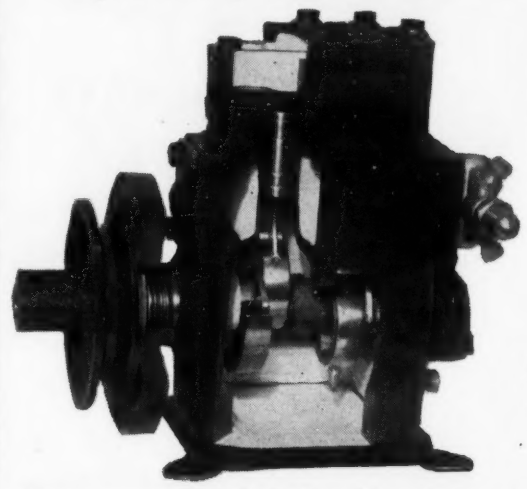

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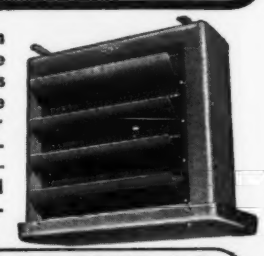

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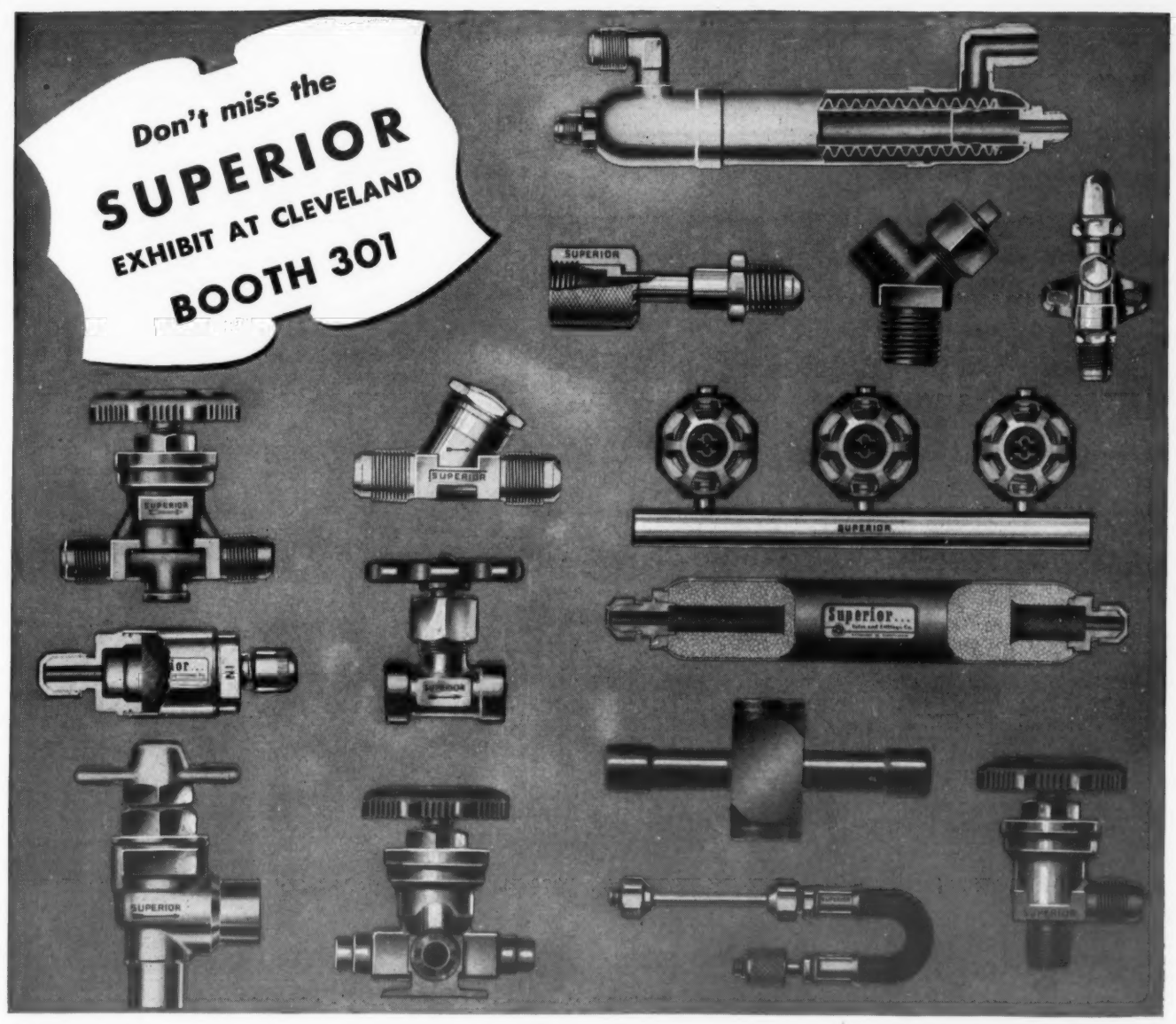

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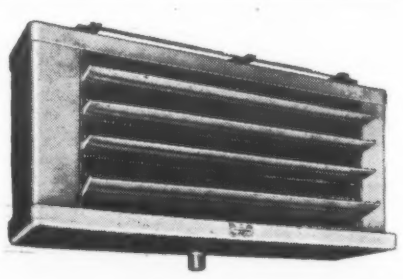

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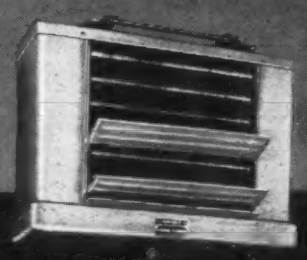

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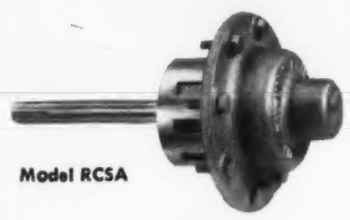
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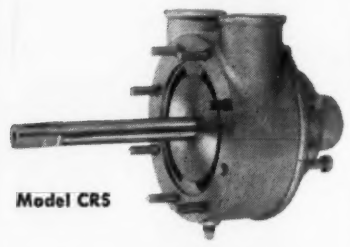
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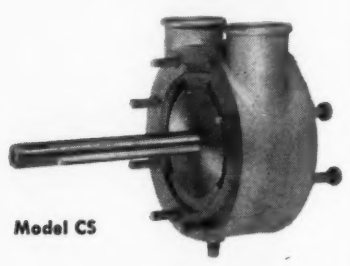
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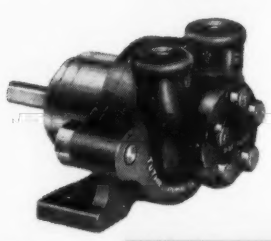
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Finding Source of Sufficient Heat Cited as Big Problem Faced by Residential Heat Pump

Utility Engineers Analyze Possibilities of Adapting Present Methods for Use In Chicago

CHICAGO—"Where can we get a source of heat at a temperature level which will make the heat pump economically practical?"

That is the principal problem to be solved to achieve widespread popularity of the heat pump as a means of residential heating, according to G. C. Wetherbee, refrigeration engineer for Commonwealth Edison Co., who with G. G. Freyder, air conditioning engineer for the utility, discussed heat pump potentials in the Chicago area before the Chicago Section, American Society of Refrigerating Engineers.

PRACTICAL HEAT SOURCES

Of the three sources of heat being used in the 160 existing heat pump installations in this country at present—outside air, well water, and ground coils—outside air and well water were dismissed by Freyder as seemingly impractical for the Chicago area.

Severe winter weather and the problem of obtaining and disposing of well water virtually eliminate these sources for Chicago, he implied, but considerable interest has been shown in two Indiana installations, one employing coils buried in the ground, the other circulating water through pipes in a well.

To obtain data for determining the size and depth of a well or size and amount of piping to be buried in the ground, Commonwealth Edison is now participating in a research project with a well type system and two buried coil setups, he added. Instead of heating a building, the heat delivered by the refrigeration systems in these experimental jobs will be accurately measured.

HOW HEAT PUMP MIGHT WORK IN CHICAGO

Just how a residential heat pump installation might work out in the Chicago area or one with a similar climate was discussed at length by Wetherbee, who selected an average family dwelling with a net annual heat loss of about 140,000,000 B.t.u. in a heating season of approximately 6,500 degree days, with a 5-hp. condensing unit installed.

"Inasmuch as one reason for heating with a heat pump is that the same equipment will be used for both winter heating and summer cooling, there will probably be a finned coil in an enclosure in the basement," he said.

HOW SYSTEM WORKS

"In the winter it will be the condenser of the refrigerating system, and in the summer it will be the evaporator. Air from the house will be forced across this coil with a fan, distributed in ducts to the various rooms, discharged into the rooms through supply grilles, removed from the rooms through return grilles, and thence be brought back to the coil through return ducts for re-use.

"With a refrigerating system, a condensing temperature of 130° F. is about as high as most engineers would want to go, at least with single-stage compression. With this limit and a reasonably sized heating coil (condenser), an air discharge temperature of 110° F. would probably be good design; that is, the air would be heated only 40° F. This means that fans, ducts, and grilles would have to be designed accordingly."

DETERMINING EFFICIENCY

In determining the efficiency of a heat pump installation, its coefficient of performance is always greater by one than the c.o.p. for a refrigeration system, points out Wetherbee.

The term "coefficient of performance" as used in refrigeration is the ratio of the heat of refrigeration to the heat equivalent of power input. Thus, a system with a refrigerating capacity of 6,826 B.t.u./hr. driven by a motor using an electrical equivalent of 3,413 B.t.u./hr. (1 kw.) would be said to have a coefficient of performance of 2. In the case of a heat pump, however, we say it has a coefficient of performance of 3 because both the heat of refrigeration and the heat equivalent of the electrical energy are useful.

The ratio for a heat pump may also be expressed as

$$\text{c.o.p.} = \frac{hr + he}{he}$$

"Thus a c.o.p. of less than unity is impossible," Wetherbee explains.

"Although the discharge temperature of 130° F. corresponding to 'Freon-12' at 180 p.s.i. is somewhat higher than that encountered in usual applications, it is not much higher than sometimes results when a condenser is air cooled.

"The compression ratio is well within the limit of single-stage 'Freon-12' machines without materially affecting efficiency, according to some compressor designers who believe it is doubtful whether the efficiency could be improved appreciably by a redesign for heat pump application.

HIGHER C.O.P. DEPENDS ON SYSTEM DESIGN

"They believe," Wetherbee said, "that a higher c.o.p. depends more upon the design of the system than upon the compressor design; that is, liberal heat transfer surfaces and maximum liquid sub-cooling.

"In spite of these statements, however, we know that the knowledge already exists regarding how to improve the operating characteristics of both motors and compressors beyond their present commercial limitations. When the heat pump market becomes sufficiently attractive to manufacturers and competitive influences begin to exert themselves, there is very little question that a c.o.p. of 3½ or more will be obtainable," he declared.

CAPACITY REQUIRED

For the typical residence being discussed, a capacity of approximately 48,000/hr. would be required of a heat pump for heating on a day when the mean temperature is 5° F., he continued, adding that in January of 1945 there were only three days colder in the Chicago area.

"Reference to typical performance data indicates that if the suction temperature was maintained at 15° F. (17.7 p.s.i.), this condensing unit would barely do the job without anything left over. There would be no reserve whatever for 'pickup' and a resort to auxiliary heating might be necessary for the sub-zero days involved."

POSSIBLE HEAT SOURCES

Six possible sources of heat for residential heat pump installations were then discussed by Wetherbee.

"First, there are streams or large bodies of water which do not freeze. An evaporator designed for a 7° t.d. immersed in 32° F. water would permit operation at the 25° F. suction temperature level. However, so few homes are adjacent to such a heat source that it can be disregarded, particularly in Chicago.

"Second, there is well water pumped and wasted. If 50° F. water were available in winter and were cooled to 35° F., it would permit operation at the 25° F. suction tem-

(Concluded on next page)

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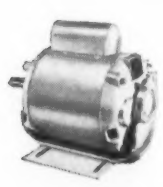
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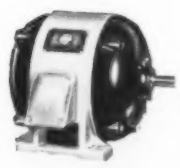
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More Data Is Required to Determine Heat Available In Ground Coils, Engineers Say

(Concluded from preceding page)

perature level or higher. However, if a refrigerating capacity of, say, 40,400 B.t.u./hr. were maintained, 5½ gal./min. would have to be pumped."

This would represent a considerable pumping cost besides the cost of the well, and the disposal of the cooled water would also create a problem, especially if many such jobs were installed, Wetherbee says, concluding that well water as a source of heat in Chicago would be practical only in limited instances.

City water in Chicago was likewise dismissed since it runs only 3° to 4° above freezing in winter months, he said.

AIR AS HEAT SOURCE

A fourth source of heat is outside air.

"Reference to Weather Bureau data shows that the atmosphere was 35° F. or warmer during 170 days of the 261 days in 1944-45 when heat was required. With an atmospheric evaporator with a 10° t.d. design, a heat pump could have operated at the 25° F. suction temperature level or higher 65% of the time. It was 25° F. or warmer 217 days out of the 261 total. With the same evaporator a heat pump could have operated at the 15° F. suction temperature level or higher 83% of the time. But what about the other 44 days, especially those around 0° F.? That is where the atmosphere as a source of heat fails.

"On a 30° F. day, our 5-hp. condensing unit would operate only 50% of the time; on a 15° F. day, 100% of the time; and on a 0° F. day, it would have only half the capacity needed to heat the house.

"And with an atmospheric evaporator, the problem of frost accumulation will always be present."

Commenting on proposals that household refrigerators and home freezers be employed as a heat source for heat pumps, Wetherbee declared, "Without considering the small amount of heat available, the mechanical complications, and temperature control difficulties, it should be remembered that no net heat whatever could be realized from either of these items if they were located within the residence to be heated.

EARTH SEEMS LAST RESORT

"Sixth, there is the earth which seems to be our last resort in this climate. The earth gets colder in winter and warmer in summer, but in depths of 2 ft. or more the change is gradual and is not sharply fluctuating from day to day like the atmosphere.

"A small home in Indianapolis has been heated by tubing buried in the earth for two winters and has received quite a lot of publicity.

"It appears that the size of the pipes, the spacing of the pipes, the kind of soil, the wetness of the soil, and the proximity to the surface will introduce a maze of variables.

"With 'K' factors for soils varying from 0.1 to 2.4, according to their composition and particularly according to their moisture content, a consistency of results appears to be impossible. The degree of continuity of the heat drain depending upon the hours of operation will also be a factor.

"In Chicago, there are three principal types of soil, each of which will have to be investigated as a heat source. On the west side there is clay; on the east side at varying distances from the lake there is sand, and in certain areas there is 'fill' consisting largely of ashes.

NO RELIABLE DATA YET

"There is yet no reliable data to prove whether pipes buried in these different soils would or would not absorb comparable amounts of heat.

"An interesting variation of the earth coil arrangement is the use of a deep well from which no water is pumped. Two pipes are placed in the well casing and connected by a return bend at the bottom to form a closed circuit with a water pump and a water chiller.

"The circulated water absorbs heat from the earth surrounding the well and the heat is delivered to the heat pump through the chiller. A few small residences have been successfully heated in this manner, according to reports."

Specific data on this problem, which Wetherbee cites as "probably the most reliable data available," is that recently published by Prof. R. A. Budenholzer as the result of research at the Armour Research Foundation, he declared, quoting as follows:

FIGURING GROUND COILS

"These studies have revealed the fact that a ¾ in. o.d. or larger coil buried 2 or 3 ft. below the average frost line will serve satisfactorily (as a source of heat) provided sufficient length of coil and proper spacing are employed to prevent excessively low refrigerant temperature inside the coil during the heating season.

"The study has indicated that when using this size coil in a soil having a thermal conductivity around 1 B.t.u. per sq. ft. per hour per degree F. per ft. of thickness, the following rule will hold approximately 1° below the surrounding uniform soil temperature for every B.t.u. withdrawn per hour per linear foot of coil exposed to the ground.

"In other words, if the average load on a certain coil buried at a depth of 6 ft. is 30 B.t.u. per linear foot per hour, and if the average temperature of the soil is 50° F., the average temperature of the evaporating refrigerant during the heating season would be approximately 50 minus 30, or 20° F."

COMPARING PIPE SIZES

Commenting on this Wetherbee states, "At the present time no one is in a position to question this statement regarding the flow of heat into buried pipes. It must be regarded as a major contribution to this new field of research. Being based as it is upon actual experimentation in a very fine laboratory, the conclusions must be accepted as correct for that particular system of buried pipes.

"But the question still remains: what if pipes of a different size were arranged differently in a different kind of earth with a different moisture content and the refrigerating system were operated at a different degree of continuity?"

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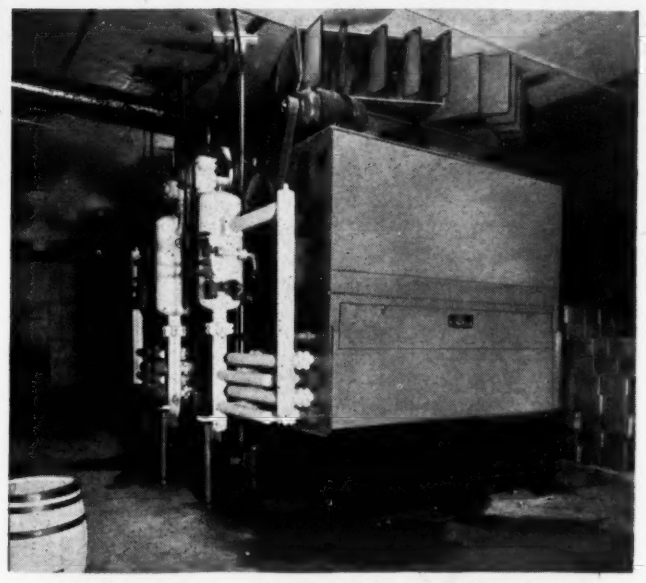
● Using the Niagara "NO FROST" Method there is NEVER any accumulation of frost and ice on the refrigeration unit. That means NO defrosting... none of its troubles and interruption to production.

It also means no loss of capacity such as occurs during the period that frost is forming and building up in thickness on refrigeration coils.

It is a system that gives you always the full capacity your plant was designed for...that is, capacity you have never been able to use if frost accumulates.

Niagara "NO FROST" Systems make more money for their owners by increasing production and by operating with lower cost for power.

Write for Bulletin No. 83-AC



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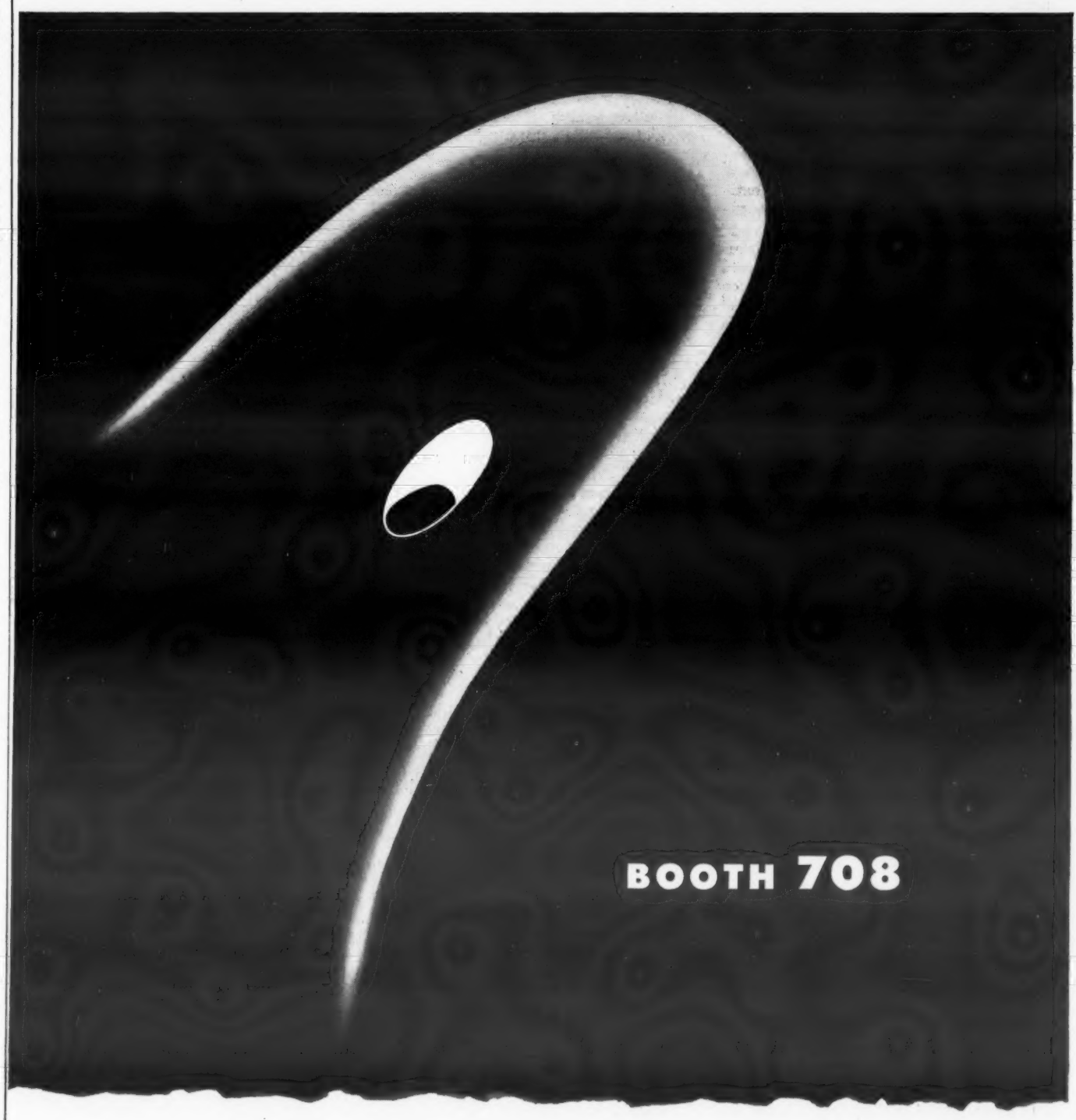

It's a date . . . Booth 708 . . . for a preview showing of several new model hermetics using Freon 12 and 22. Fifth Annual All-Industry Refrigeration and Air Conditioning Exposition . . . Cleveland Public Auditorium . . . January 26 through 29.

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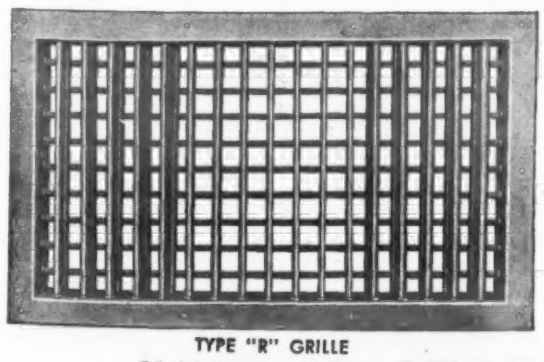

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IN ALL HEIGHT AND WIDTH COMBINATIONS

Alton Grilles give you even distribution, uniform velocity, minimized resistance and noise elimination. Attractively designed units that harmonize with modern construction . . . tough all-metal welded casings for flush mounting in wall or duct. Each "tear drop" designed blade, individually adjustable for 4-way direction control.

"Specially designed for Refrigerated Air Conditioning"

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Cooling and Ventilating Equipment

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Quick-Freezing of Poultry by the Thousands Requires Wide Variety of Cooling Equipment

• • •

To maintain its high rate of production in the quick-freezing of poultry, a new plant in Mt. Vernon, Wash., has 15 freezing cells where air at temperatures of 40° below zero is circulated through the product which is packed in shipping containers and stacked on pallets.

• • •

Ultra-Modern Plant In Washington Now Processes, Freezes 16,000 Chickens & 8,000 Turkeys Daily

MT. VERNON, Wash.—An ultra-modern poultry processing plant where chickens and turkeys are quick-frozen with Frick "Blizzard" equipment at the rate of 16,000 chickens and six to eight thousand turkeys daily is now in operation here.

Built at a cost of $500,000, the plant is one of the most modern and largest in the nation. It is owned by the Washington Co-Operative Farmers Association.

The complete refrigerating system, from pre-cooling rooms to freezing cells, was designed and installed by the Lewis Refrigeration & Supply Co., Seattle. Unofficial estimates place the cost of the refrigeration installation at $80,000.

The plant has a capacity of processing poultry at the rate of 4,000 pounds per hour. The latest in eviscerating equipment is provided for the separate processing lines which handle the turkeys and chickens. All poultry passes through four refrigerated pre-cooling rooms which have a total volume of 35,000 cu. ft. and a combined capacity for pre-cooling 96,000 pounds of poultry daily.

The rapid pre-cooling is accomplished by floor-mounted ammonia refrigerated brine spray units which automatically maintain temperatures of from 32° to 34° F. through the use of thermostatic controls, electric valves, refrigerant float level valves and refrigerant pressure regulation.

A minimum of 3,600 cu. ft. per minute of air is in circulation within each of the pre-cooler rooms. This air volume, in circulation through a small temperature range, produces rapid pre-cooling of the poultry with a minimum weight loss.

Sodium chloride brine is circulated at the rate of 15 g.p.m. from a small ⅓-hp. centrifugal pump. The recirculated brine keeps the cooling coils free from ice and frost and provides maximum efficiency of the cooling surface, permitting the cooling coils to operate with high refrigerant temperatures which contribute to higher relative humidities desirable in the pre-cooling rooms.

Poultry which is to be frozen is packed in the shipping containers, loaded onto pallets with spacer stripping and then moved by lift trucks into the freezer cells. Fifteen freezing cells are provided, all of equal capacity, and of Frick Blizzard design. Their combined capacity is 80,000 pounds of poultry per day. All the cells are adjacent to each other and are refrigerant controlled in groups of five, making a total of three control circuits for the 15 cells.

Each cell is 17 ft. 2 in. long, 10 ft. high and 4 ft. 6 in. wide. Overhead in each cell special double nested ammonia refrigerated "VW" coils were installed in connection with an Axiflow type pressure fan. Adjustable louvers and dampers for the proper adjustment of air flow to the product freezing area are installed at the rear of each cell. The underside of the coil bunkers are equipped with hinged doors for easy access to the refrigerated coils during defrosting.

Rapid defrosting of the coils is accomplished by the use of hot gas and condensed liquid crossover lines. Metal pans on pallets are placed in the cells for collecting water from the defrosting operation, a process which is accomplished in a few minutes.

The pallets of poultry to be frozen occupy a space 12 ft. long by 5 ft. 10 in. high and 4 ft. wide. Air at the rate of 7,500 cu. ft. per minute at temperatures to 40° below zero is circulated through the stacked poultry. After passing through the product zone, the air turns upward and then goes through the special double nested "VW" coils, and from there to the suction of the Airflow type fans where it is deflected downward and directed by splitters and louvers into the product freezing area.

Minimum air temperature ranges are obtained with the air volume in circulation and with low air temperatures provided for the best possible freezing results.

The frozen poultry is stored in the low temperature holding room which has a volume of 54,800 cu. ft. This space is refrigerated to an average temperature of 0° F. by use of two automatically controlled water defrost floor-mounted air cooling units, both of which are provided with automatic temperature control as well as automatic refrigerant control.

A 3-hp. fan motor on each air unit circulates 10,000 cu. ft. of air per minute. Periodic defrosting of the finned refrigerant coil is accomplished by use of water spray. Frozen poultry is held in the holding room, at 0° temperature, for shipment by refrigerated truck or railroad car.

A Frick two-stage ammonia booster refrigerating system is employed for producing the low temperatures required in the 15 freezing cells. Ammonia suction vapor from the cooling coils in the cells, after being collected in horizontal surge drums, is piped directly to a Frick two-cylinder 15 x 10 ammonia booster compressor which operates at 360 r.p.m., having a gross displacement of 734 cu. ft. per minute. The compressor is driven from a 100-hp. induction motor through V-belts.

The booster compressor is equipped with capacity reduction devices, providing a means for balancing the compressor to the actual freezing load requirements, thereby providing for maximum economy of operation. Higher booster compressor efficiency is obtained by use of special ammonia refrigerated cylinder cooling.

The discharge vapor from the booster compressor is piped to a multiple shell and tube water-cooled

(Concluded on next page)

4 Pre-Cooling Rooms Serve Poultry Plant

There are four pre-cooling rooms like the above in the Mt. Vernon plant which have a combined capacity of 96,000 lbs. of poultry per day. A minimum of 3,600 c.f.m. of 32° to 34° F. is circulated through each of these rooms. Their combined volume is 35,500 cu. ft.

Most Modern—Most Efficient
Most Economical To Use

The "NAT" Suspended GAS UNIT HEATERS

85,000-125,000 and 165,000 BTU Capacity
Available for Natural, Butane or Propane Gases.
Delivery within 3 or 4 days.
Some exclusive territories still available.

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We also manufacture a combination heating and cooling unit, gas fired furnace and the NAT "Self-Contained" Air conditioning unit.

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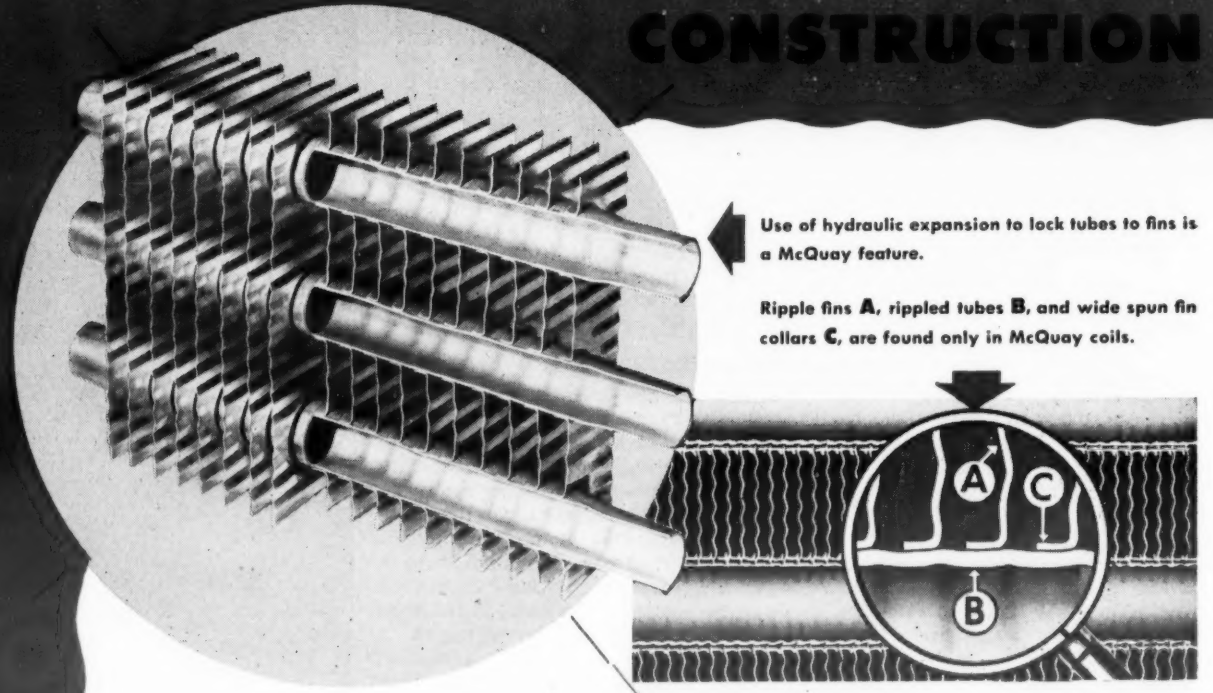
Only McQuay gives you
RIPPLE FIN, RIPPLE TUBE CONSTRUCTION



Use of hydraulic expansion to lock tubes to fins is a McQuay feature.

Ripple fins **A**, rippled tubes **B**, and wide spun fin collars **C**, are found only in McQuay coils.

Basic in the entire McQuay line is the Ripple-Fin, Ripple-Tube coil. Hydraulic expansion methods, pioneered by McQuay, allow production of a rigid, vibration-free coil section that offers maximum heat transfer efficiency under all operating conditions. Heavy industrial usage has proved the superiority of Ripple-Fin construction in countless heat transfer applications.

Permanent contact, a "must" for heat transfer efficiency, is assured three ways in McQuay coil construction. First, aluminum fins are permanently locked to electro-tin coated copper tubes by hydraulic pressure alone, without use of any low conductivity bonding metal. Second, wide spun-fin collars provide greater area of contact between primary and secondary surfaces for rapid low-loss heat transfer. Third, fin collars smoothed by the spinning action of the collar-forming tool offer an ideal contact surface, increase actual metal-to-metal contact between fin and tube.

Hydraulically expanded tubes with resulting rippled inner surface assure proper turbulence of the refrigerant—maximum refrigerating effect. Select high efficiency for *your* cooling operation with light-weight, durable Ripple-Fin coils. See your refrigeration wholesaler today, or write directly to McQuay, Inc., 1607 Broadway Street Northeast, Minneapolis 13, Minnesota.

N E

McQuay INC.

IN HEATING, AIR CONDITIONING, AND REFRIGERATION "IT'S THE REAL McQUAY"

Poultry Processing--

(Concluded from preceding page)

gas cooler, and from this cooler the gas and liquid cooler. The liquid supply from the liquid ammonia receiver is carried through cylindrical coils contained within the gas and liquid cooler, thereby subcooling it before it is expanded into the various cooling coils.

Cooled vapor from the gas cooler is piped to the suction of the second stage compressor, which is a Frick two-cylinder 10 x 10 vertical, single acting enclosed ammonia compressor operating at 300 r.p.m., having a gross displacement of 272.7 cu. ft. per minute. This compressor is driven from a 100-hp. induction motor through a V-belt drive.

The 10 x 10 second stage compressor, like the booster compressor, is equipped with capacity reduction devices for economically balancing the compressor operation as to the load requirements. The discharge vapor from the second stage compressor is carried to an evaporative condenser, located outside the building, where the refrigerant vapors are condensed and the liquid refrigerants carried to a large common ammonia liquid receiver.

Three Frick 6 x 6 two-cylinder, vertical single acting ammonia compressors, each driven from 30-hp. motors at 400 r.p.m. through V-belt drives, are used to automatically refrigerate the four pre-cooler rooms and the large 0° holding room. These compressors are cross connected in order to provide the most flexible operating conditions. The discharge of these three 6 x 6 compressors is carried to a separate evaporative condenser installed outside.

Greater Profits Seen If Air Conditioning Is Installed In Commercial Greenhouses

Operator Made $30,000 In 2 Years on Orchids Which Usually Takes 4 Years, ASRE Is Told

ATLANTIC CITY, N. J. — More profitable operation of greenhouses is quite possible with the use of air conditioning to control and speed up the growth of plants and flowers, it was implied by Arthur J. Hess at a technical session of the American Society of Refrigerating Engineers' annual meeting here.

He discussed "Technical Features of Greenhouse Air Conditioning," a paper which had been prepared by L. C. Marshall, H. O. Eversole, F. W. Went, and himself.

MAKES 'QUICK' PROFIT

Just how much air conditioning can help this growth and how it can pay off for the greenhouse operator was illustrated by Hess with the statement that one greenhouse had made a profit of more than $30,000 on orchids in two years using air conditioning, where usually four years would be required to grow these orchids.

Plants, like human beings, are subject to drafts and "colds," declared Hess, who also added that plants require different conditions during the day than they do during the night. During the day, he explained, the plant does its photosynthesis work, but it actually grows during the night.

In the daytime, for example, the tomato requires a temperature of 80° to 90° F. with the relative humidity between 50% and 80%, according to Hess. At night, however, the optimum conditions for the tomato are 65° F. and 95% r.h., he said.

When it comes to designing an air conditioning system for a greenhouse, the heaviest daytime load is the sun load, pointed out Hess.

"Many greenhouses are partially or completely shaded during the summer to keep down the heat, which would hurt plants, but the lack of sunshine also cuts plant growth," he explained.

To cut down this load and still permit sunlight to reach the plants, experiments with a water spray on the greenhouse glass roof have been conducted for a number of years.

A layer of water on the roof approximately ⅛ in. thick can remove all the radiant heat in the infra-red spectrum, and altogether can remove about 20% of the radiant heat, said Hess.

There are, moreover, several advantages to be gained from this water spray method:

(1) A cool surface is presented to the warm air rising in the greenhouse. This can result in a saving of 1,500 B.t.u./hr./1,000 sq. ft./degree temperature difference between the water and inside air.

"At 10° T.D., this means saving 15,000 B.t.u. an hour, which is quite a saving," continued Hess.

(2) Water keeps the glass surface clean and lets the more desirable wave lengths come in.

(3) Plants can radiate to cooler surfaces.

(4) Water diffuses the sunlight so that it is more normal.

(5) About 10% of the radiant heat is reflected by the water surface.

What would be a normal load of 123,000 B.t.u./hr./1,000 sq. ft. of roof area would be almost halved by the water's picking up 57,500 B.t.u. The remaining load, however, is still so great that all other loads can be ignored, Hess stated.

WATER SPRAYS USED

The actual water-spray system consists essentially of a water pump, sprays between each pair of rafters on the roofs, water return lines, and a sand gravity filter to remove leaves, algaes, and other impurities. Generally about 1 g.p.m. is required for each 16-in. channel in the greenhouse roof, he stated.

As for the air conditioning system within the greenhouse, an average of 5,000 c.f.m. for a 10° T.D. is required for each 1,000 sq. ft. of room area.

Air distribution is a considerable problem in greenhouses, said Hess, who recommended two methods. In one system the air is forced through ducts in the middle of the floor, rising by chimney effect, and being returned through ducts along the side walls.

The other method employs the entire space below the greenhouse floor as a plenum chamber, the air being admitted through slots in the floor. The slots are about ⅛ in. to ¼ in. wide, and the air velocity through them is about 800 f.p.m. This method is especially recommended for research greenhouses where the plants are usually kept on hand-trucks, explained Hess.

Conventional ceiling ducts and outlets are not advisable for greenhouses chiefly because they will cast shadows and affect plant growth, he declared.

For the refrigeration plant, the greenhouse described by Hess employed a chilled water system with a "buffer" tank. Flywheel effect of the latter permitted a smaller system to handle the heavy load.

NIGHT TEMPERATURES CRITICAL

Daytime temperatures are not generally critical, but those at night are, for then the plant actually grows. Tomatoes, he said, will grow well at high night temperatures, but they won't set fruit. Daytime temperatures can run as high as 10° to 15° above design conditions without causing any trouble, but night temperatures must be kept close to desired conditions, Hess declared.

While insulation of the greenhouse is not of extreme importance, it should be kept airtight, and a careful study of glazing methods and materials is important, especially in view water sprays being used on the roof.

Kelly, Wolcott Elected To York Corp. Board

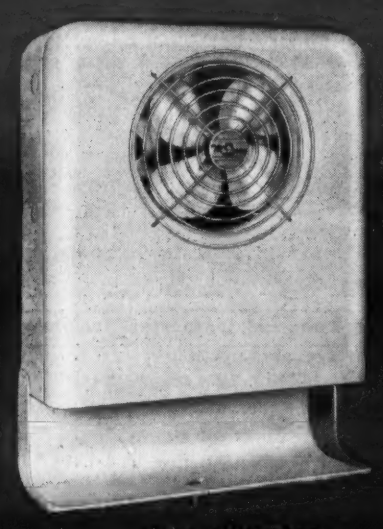
YORK, Pa.—At the annual meeting Jan. 13 of the stockholders of York Corp., William J. Kelly and Robert W. Wolcott were elected directors to fill two vacancies, while George S. Munson and Llewellyn Williams were re-elected directors for three-year terms.

All officers of the corporation were re-elected at the meeting of the directors following the stockholders meeting.

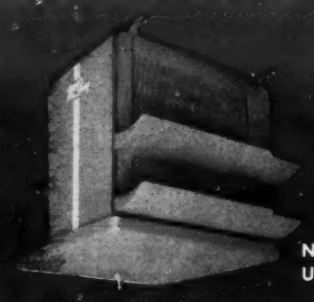
William J. Kelly, one of the newly elected directors, is president of the Machinery & Allied Products Institute, a federation of associations made up of capital goods manufacturers, whose primary purpose is economic research.

Robert W. Wolcott is president and a director of Lukens Steel Co. of Coatesville, Pa.

COOLING UNITS



PANEL TYPE CHILLATOR

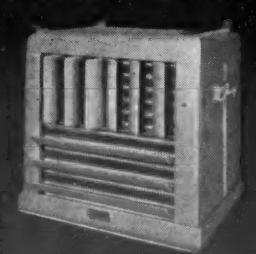


NORMAL PURPOSE UNIT COOLER

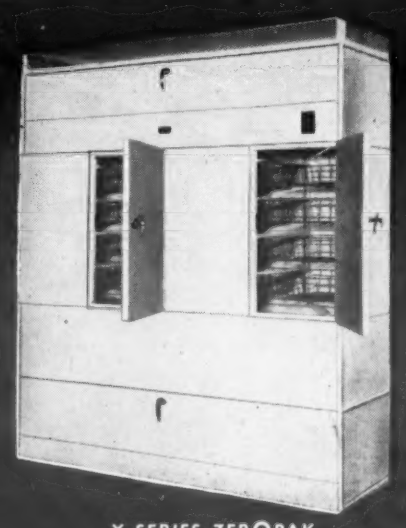
CEILING TYPE CHILLATOR

LOW TEMPERATURE UNITS

L SERIES ZEROPAK

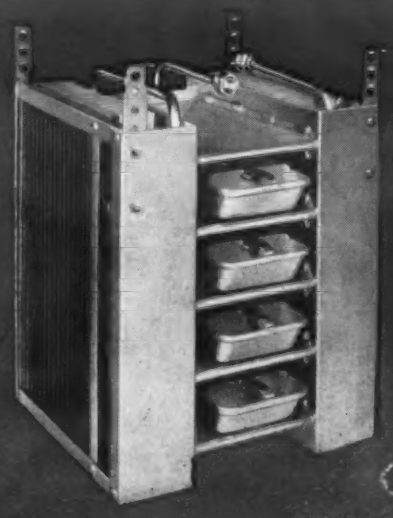


DUAL PURPOSE UNIT COOLER



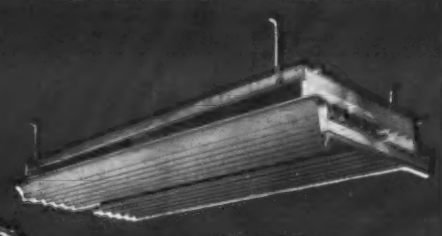
X SERIES ZEROPAK

SPECIAL APPLICATIONS



QUICK RELEASE ICE CUBE MAKER

DISPLAY CASE COIL



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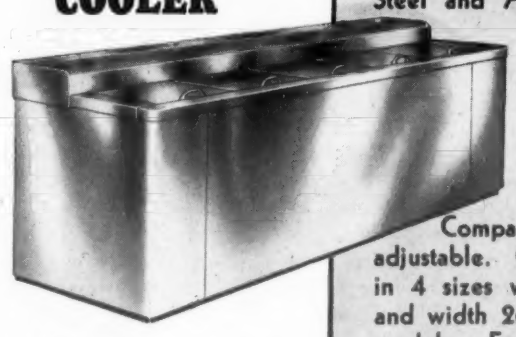
Enjoy the Economy of Quality with

BEVERAGE-AIR

BEVERAGE COOLER



Self-Contained or Remote Model B-78-7

IT'S NON-CORROSIVE!

Well constructed of Stainless Steel and Aluminum, heavily insulated, this cooler affords you more capacity in less space than any other cooler.

Compartment dividers are adjustable. Cooler is available in 4 sizes with height 33⅛" and width 26" standard on all models. Front, top and ends are Stainless Steel.

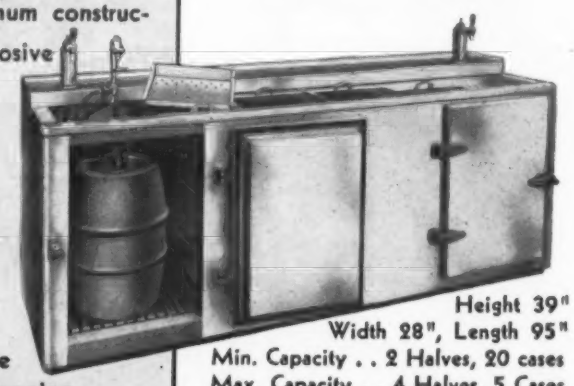
IT'S VERSATILE!

Another "First" in Stainless Steel and Aluminum construction. A non-corrosive Bar with adjustable compartment dividers . . . heavily insulated . . . removable drain pans and lids to facilitate keg handling and tapping.

Stainless Steel Front, Top, Ends.

BEVERAGE-AIR

CLUB-BAR



Height 39"
Width 28", Length 95"
Min. Capacity . . 2 Halves, 20 cases
Max. Capacity . . 4 Halves, 5 Cases
(Optional) The Club-Bar is available with black "cigarette-proof" Micarta Top to make it a complete serving unit.

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PUNXSUTAWNEY COMPANY

Punxsutawney Pennsylvania

Dealers and Distributors: Write for our distribution policy on these units.

Perfection WALK IN REFRIGERATORS

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The "Bromann" Perfection cooling room has been manufactured of the highest quality workmanship and design for over **50 years.**

Today this "Perfection" walk-in refrigerator is a source of added profit, a creator of new customers, and a vital and essential part of successful merchandising.

NOW AVAILABLE IN ALL SIZES

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MANUFACTURERS OF REFRIGERATOR EQUIPMENT AND BUTCHER SUPPLIES FOR OVER 50 YEARS.

71 Producing Firms Submitted Sales Data For the Third Quarter

WASHINGTON, D. C.—The tabulated figures on third-quarter sales of air conditioning and commercial refrigeration equipment, as released by the U. S. Bureau of the Census, is based on reports submitted by 71 manufacturers—two less than in the second quarter.

Estimates were made for a few companies, representing—according to the Bureau of the Census—a small portion of the industry that failed to get its reports in on time.

Shipment statistics included in the report apply to equipment actually billed and shipped. These figures are equivalent to completed sales. Complete units delivered on consignment or shipped to a branch warehouse for stocks are not included until such time as they are actually sold. Dollar values shown are the manufacturers' net billing prices, f.o.b. factory.

The tables in the Bureau of Census report present information on manufacturers' shipments of air conditioning equipment, and components and accessories for air conditioning and commercial refrigeration equipment.

First part of Table 1 presents summary data on domestic and export shipments for the second quarter of 1947, revised since its previous publication. The second part of Table 1 presents similar data for the third quarter of 1947.

Table 2 covers detailed information by type of equipment on such products, for the third quarter.

Air Conditioning, Commercial Refrigeration Shipments for Third Quarter of 1947

Table 1—Air Conditioning Equipment and Components and Accessories for Air Conditioning and Commercial Refrigeration Equipment: Summary of Shipments by Major Class of Product, Second and Third Quarters 1947

Second Quarter 1947*
Shipments of Complete Units

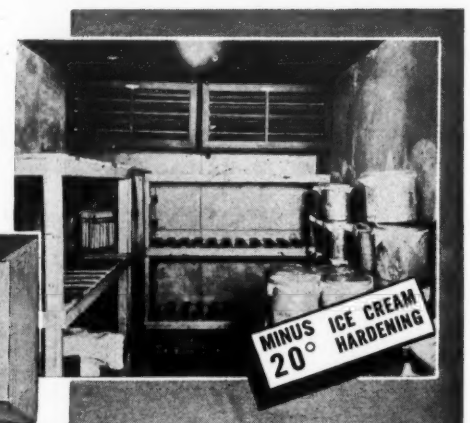
Product	Total No.	Total Value (dollars)	Domestic† No.	Domestic† Value (dollars)	Export‡ No.	Export‡ Value (dollars)
Section I—Components and Accessories						
Total	....	**49,521,308**	....	**45,652,730**	....	**3,868,578**
Condensing units	319,542	23,697,656	302,451	21,702,375	17,091	1,995,281
Ammonia refrigerants	438	533,470	395	488,132	43	45,338
Refrigerants except ammonia	319,104	23,164,186	302,056	21,214,243	17,048	1,949,943
Air cooled	308,017	18,897,124	292,060	17,362,437	15,957	1,534,687
Open type	140,534	12,257,495	126,585	10,867,251	13,949	1,390,244
Hermetic type	167,483	6,639,629	165,475	6,495,186	2,008	144,443
Water cooled	11,087	4,267,062	9,996	3,851,806	1,091	415,256
Compressors, compressor units	181,624	10,124,653	172,181	9,190,434	9,443	934,219
Ammonia refrigerants	1,118	2,152,382	935	1,670,631	183	481,751
Refrigerants except ammonia	180,506	7,972,271	171,246	7,519,803	9,260	452,468
Centrifugal refrigeration machines	71	1,558,179	58	1,378,533	13	179,646
Heat exchanger equipment	....	14,140,820	....	13,381,388	....	759,432
Evaporative condensers	1,541	1,844,920	1,460	1,765,917	81	79,003
Unit coolers	40,570	5,498,214	37,431	5,136,933	3,139	361,281
Air conditioning	5,087	1,767,027	4,796	1,701,872	291	65,155
Refrigeration	35,483	3,731,187	32,635	3,435,061	2,848	296,126
Other heat exchanger equipment§	....	6,797,686	....	6,478,538	....	319,148
Section II—Self-Contained Air Conditioning Units and Ice Making Machines						
Self-contained air conditioning units	25,240	10,626,892	23,274	9,767,959	1,966	858,933
Room type	18,397	4,056,034	16,799	3,486,851	1,598	569,183
Other than room type	6,843	6,570,858	6,475	6,281,108	368	289,750
Ice making machines	973	517,099	897	489,861	76	27,238

Third Quarter 1947
Shipments of Complete Units

Product	Total No.	Total Value (dollars)	Domestic† No.	Domestic† Value (dollars)	Export‡ No.	Export‡ Value (dollars)
Section I—Components and Accessories						
Total	....	**43,944,234**	....	**39,666,945**	....	**4,277,289**
Condensing units	293,238	20,994,951	275,229	19,033,272	18,009	1,961,679
Ammonia refrigerants	419	560,316	370	510,477	49	49,839
Refrigerants except ammonia	292,819	20,434,635	274,859	18,522,795	17,960	1,911,840
Air cooled	283,972	16,808,899	266,572	15,210,838	17,400	1,598,061
Open type	117,940	10,456,526	102,391	8,944,141	15,549	1,512,385
Hermetic type	166,032	6,352,373	164,181	6,266,697	1,851	85,676
Water cooled	8,847	3,625,736	8,287	3,311,957	560	313,779
Compressors, compressor units	159,242	8,916,371	151,001	7,946,163	8,241	970,208
Ammonia refrigerants	970	2,260,309	762	1,803,208	208	457,101
Refrigerants except ammonia	158,272	6,656,062	150,239	6,142,955	8,033	513,107
Centrifugal refrigeration machines	84	2,086,789	63	1,631,291	21	455,498
Heat exchanger equipment	....	11,946,123	....	11,056,219	....	889,904
Evaporative condensers	1,556	1,924,579	1,407	1,768,526	149	156,053
Unit coolers	33,227	4,797,278	29,864	4,356,959	3,363	440,319
Air conditioning	4,032	1,492,847	3,476	1,354,631	556	138,216
Refrigeration	29,195	3,304,431	26,388	3,002,328	2,807	302,103
Other heat exchanger equipment§	....	5,224,266	....	4,930,734	....	293,532
Section II—Self-Contained Air Conditioning Units and Ice Making Machines						
Self-contained air conditioning units	15,854	9,094,060	14,670	8,454,121	1,184	639,939
Room type	7,927	1,818,474	7,021	1,483,112	906	335,362
Other than room type	7,927	7,275,586	7,649	6,971,009	278	304,577
Ice making machines	1,866	627,761	1,722	489,899	144	137,862

*Revised. †Continental United States. ‡Includes Canada, Mexico, and United States territories. §Includes condensers and liquid coolers, shell and tube and shell and coil types, as well as fin coils (heating and cooling), and plate type evaporators.

Where DEFROSTING is a problem use THERMOBANK by KRAMER



Only THERMOBANK *Keeps Coils Frost-Free Automatically at Freezer Temperatures without*

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KRAMER TRENTON CO. *Trenton, N. J.*

Fine PRODUCTS

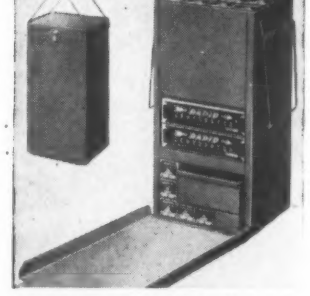
DESIGN-ENGINEERED FOR RUGGED SERVICE

RAPID Refillable DEHYDRATORS

Really dehydrate; maximum dispersion area, thoro contact with silica gel. Sturdy one-piece, triple sealed, leakproof shell. Removable, finger type screens (inlet *and* outlet) permit easy cleaning, without damage.

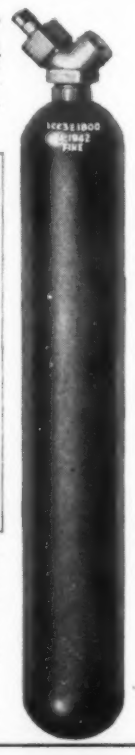
Eight practical sizes: 5 to 200 cu. in.

DEHYDRATOR INDICATOR—Inserted directly ahead of expansion valve, dehydrator and liquid indicator combination eliminates joints, provides neat appearance. Two sizes, 10 or 20 cu. in.



RAPID DEHYDRATOR KIT—New, practical, convenient. Compact carrying case for 18 dehydrators—6 different sizes — sliding drawers contain replacement parts. Saves time and expense; assures clean packages at installation.

CHARGING BOMB—Provides manufacturer with accurate and quick method of charging *small* units for assembly line and field servicing. ICC stamped.



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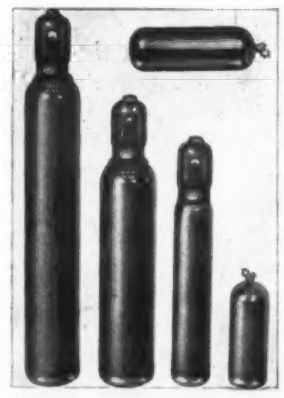


SEAMLESS REFRIGERANT CYLINDERS—Built and stamped to ICC 3B-300 specifications. Seamless construction. Complete with valves, caps, etc. Standard sizes: 5#, 5# Erect, 10#, 25#, 35#.

CHARGING HOSES—Heavy duty rayon reinforced neoprene hose. Exceptionally flexible and sturdy. 36" lengths. Inexpensive. Two types: A — Standard. B — Quick-Coupler.

FINE PRODUCTS CO. **185 N. WABASH AVE. CHICAGO 1**

Breakdown of Third-Quarter Sales of Condensing Units by Size and Type

Table 2—Air Conditioning Equipment and Components and Accessories for Air Conditioning and Commercial Refrigeration Equipment: Shipments by Type of Product, Third Quarter 1947

Product	Shipments of Complete Units: Total No.	Total Value (dollars)	Domestic* No.	Domestic* Value (dollars)	Export† No.	Export† Value (dollars)	No. of Comps. Made by Reporting Firms and Used In Units Reported as Shipped	No. of Plants Reporting
Section I—Components and Accessories								
Total	....	43,944,234	....	39,666,945	....	4,277,289	....	70
Condensing units, total	293,238	20,994,951	275,229	19,033,272	18,009	1,961,679	....	34
Refrigerants except ammonia, total	292,819	20,434,635	274,859	18,522,795	17,960	1,911,840	....	31
Air cooled, total	283,972	16,808,899	266,572	15,210,838	17,400	1,598,061	....	27
Open type, total	117,940	10,456,526	102,391	8,944,141	15,549	1,512,385	....	25
⅕ hp. and under	7,136	319,636	6,177	267,803	959	51,833	....	8
¼ hp.	27,631	1,686,581	23,143	1,392,237	4,488	294,344	....	23
⅓ hp.	44,240	3,211,229	38,856	2,777,116	5,384	434,113	....	25
½ hp.	22,050	2,221,178	19,648	1,953,456	2,402	267,722	....	23
¾ hp.	8,759	1,216,172	7,816	1,072,535	943	143,637	....	20
1 hp.	3,959	708,242	3,372	593,832	587	114,410	....	21
1½ hp.	1,983	461,016	1,645	380,610	338	80,406	....	19
2 hp.	1,422	377,341	1,100	293,032	322	84,309	....	16
3 and 5 hp.	760	255,131	634	213,520	126	41,611	....	11
Hermetic type								
Total	166,032	6,352,373	164,181	6,266,697	1,851	85,676	....	11
½ hp. and under	114,633	2,672,294	113,342	2,624,406	1,291	47,888	....	6
¾ hp.	35,664	2,531,917	35,349	2,512,806	315	19,111	....	10
1 hp.	11,301	723,129	11,140	712,066	161	11,063	....	8
1½ hp. and over	4,434	425,033	4,350	417,419	84	7,614	....	5
Water cooled, total	8,847	3,625,736	8,287	3,311,957	560	313,779	....	25
⅓ hp. and under	100	11,337	95	10,803	5	534	....	5
½ hp.	1,682	226,043	1,602	214,312	80	11,731	....	13
¾ hp.	1,289	206,715	1,256	201,651	33	5,064	....	16
1 hp.	1,252	238,759	1,214	231,324	38	7,435	....	19
1½ hp.	796	188,160	755	178,956	41	9,204	....	18
2 hp.	652	182,089	583	162,536	69	19,553	....	17
3 hp.	898	320,362	839	298,602	59	21,760	....	18
5 hp.	686	357,336	641	334,737	45	22,599	....	16
7½ hp.	392	339,744	349	305,317	43	34,427	....	12
10 hp.	554	537,342	480	468,041	74	69,301	....	13
15 hp.	214	280,620	192	257,101	22	23,519	....	12
20 hp.	123	209,993	103	175,633	20	34,360	....	9
25 hp.	73	112,240	57	90,543	16	21,697	....	10
30 hp.	30	68,867	26	61,351	4	7,516	....	6
40 hp.	37	79,605	33	72,522	4	7,083	....	4
50 hp. and over	69	266,524	62	248,528	7	17,996	....	6
Ammonia refrigerants								
Reciprocating water cooled, total	419	560,316	370	510,477	49	49,839	....	7
7½ hp. and under	155	124,184	128	103,972	27	20,212	....	6
10 hp.	84	101,263	72	87,880	12	13,383	....	7
15 hp.	106	172,015	103	167,121	3	4,894	....	5
20 hp. and over	74	162,854	67	151,504	7	11,350	....	3
Compressors and compressor units, total	159,242	8,916,371	151,001	7,946,163	8,241	970,208	250,744	27
Refrigerants except ammonia, total	158,272	6,656,062	150,239	6,142,955	8,033	513,107	250,527	24
¼ hp. and under	129,378	3,398,959	125,093	3,342,520	4,285	56,439	162,029	13
⅓ hp.	18,610	620,462	16,253	569,257	2,357	51,205	40,059	14
½ hp.	5,736	192,537	5,196	178,190	540	14,347	20,405	13
¾ hp.	643	31,443	578	28,018	65	3,425	10,989	15
1 hp.	638	28,502	282	12,723	356	15,779	3,551	13
1½ hp.	109	7,088	80	4,536	29	2,552	2,327	13
2 hp.	380	25,989	372	25,292	8	697	1,726	12
3 hp.	489	43,492	373	30,387	116	13,105	3,330	15
5 hp.	596	169,190	546	150,632	50	18,558	4,861	14
7½ hp.	283	85,061	266	77,132	17	7,929	320	10
10 hp.	215	149,909	192	132,589	23	17,320	482	14
15 hp.	293	234,113	257	203,967	36	30,146	176	12
20 hp.	133	197,071	106	157,422	27	39,649	112	10
25 hp.	261	279,902	248	261,659	13	18,243	66	10
30 hp.	110	184,041	81	134,074	29	49,967	20	9
40 hp.	123	259,072	102	214,691	21	44,381	28	9
50 hp.	165	344,121	117	254,364	48	89,757	19	8
60 hp.	47	134,347	36	101,920	11	32,427	3	7
75 hp.	31	96,400	30	93,034	1	3,366	21	5
100 hp. and over	32	174,363	31	170,548	1	3,815	3	4
Ammonia refrigerants, total	970	2,260,309	762	1,803,208	208	457,101	217	10
7½ hp. and under	43	19,702	34	13,857	9	5,845	131	4
10 hp.	77	61,445	67	53,763	10	7,682	59	6
15 hp.	61	57,182	54	50,816	7	6,366	14	6
20 hp.	88	96,720	55	59,687	33	37,033	13	8
25 hp.	111	160,545	83	119,460	28	41,085	....	4
30 hp.	151	219,513	126	179,942	25	39,571	....	6
40 hp.	48	90,119	42	80,494	6	9,625	....	7
50 hp.	70	142,383	53	101,537	17	40,846	....	3
60 hp.	113	274,248	89	224,446	24	49,802	....	5
75 hp.	74	247,452	56	188,582	18	58,870	....	6
100 hp.	68	262,135	47	182,514	21	79,621	....	5
101 hp. and over	66	628,865	56	548,110	10	80,755	....	4

Stevens Joins Midwest Commercial Distributor In Twin-Cities Area

MINNEAPOLIS—Don E. Stevens, formerly president of Twin City Refrigeration, Inc. of St. Paul, has joined Palm Brothers, Inc., distributor here, the latter firm has announced.

Don E. Stevens

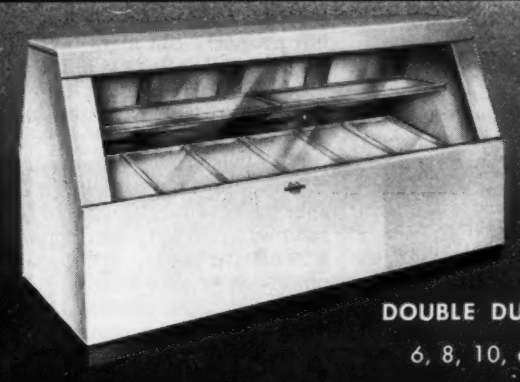
Stevens said he would inaugurate a dealer sales program throughout the company's territory. Palm Brothers distribute refrigerated equipment for Sherer-Gillett Co., store fixtures for Vitro Products, Inc., soda fountains for Bastian-Blessing Co., and ice cream cabinets for Savage Arms Corp.

G. T. Abel Heads Jacobs Indianapolis Division

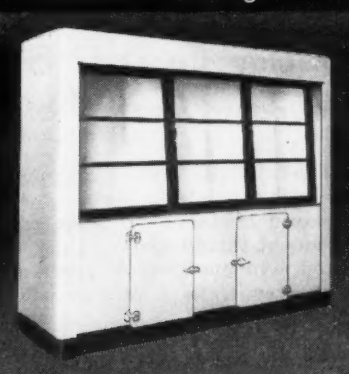
DETROIT—Appointment of George T. Abel as vice president in charge of Indianapolis Division of F. L. Jacobs Co., manufacturer of the Launderall automatic home laundry and Coca Cola bottle vending machines, has been announced by Rex C. Jacobs, president.

Abel was formerly associated with Martin Parry Corp. He was also with Pontiac Division for Fisher Body Division of General Motors from 1929 to 1946.

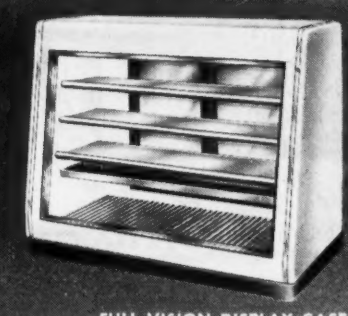
GOLD SEAL proudly offers



DOUBLE DUTY DISPLAY CASE
6, 8, 10, and 12 ft. lengths
modern design . . . modern construction



DOUBLE DUTY REFRIGERATED SELF-SERVICE WALL CASE
7,8 and 10 ft. lengths



FULL VISION DISPLAY CASE
4 and 6 ft. lengths

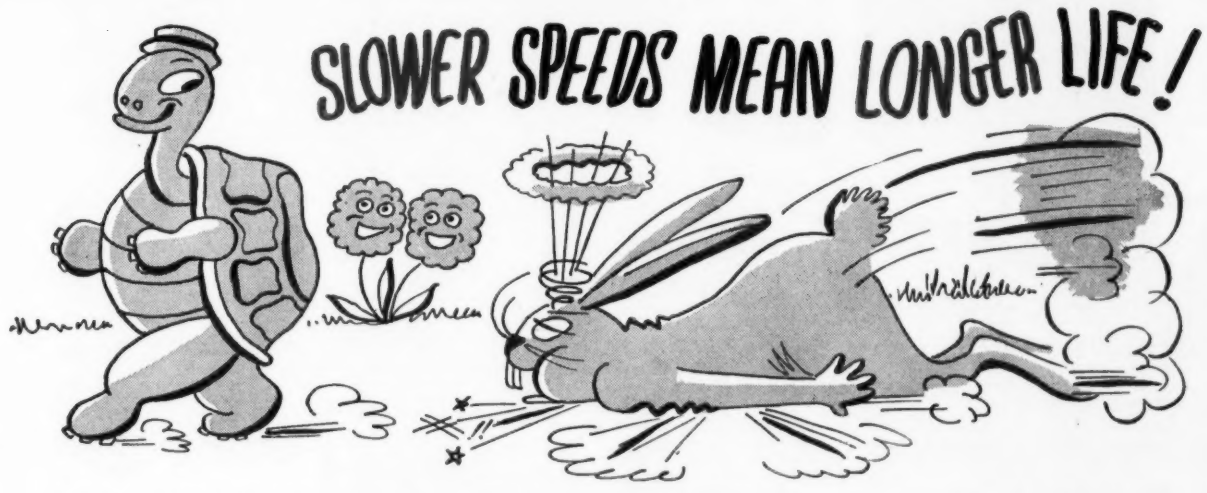
IMMEDIATE DELIVERY

GOLD SEAL REFRIGERATION INC.
4412 Park Avenue • New York 58, N. Y.

BRUNNER SINCE 1906 REFRIGERATION helps you serve better

Memo to Shrewd Business Men

SLOWER SPEEDS MEAN LONGER LIFE!

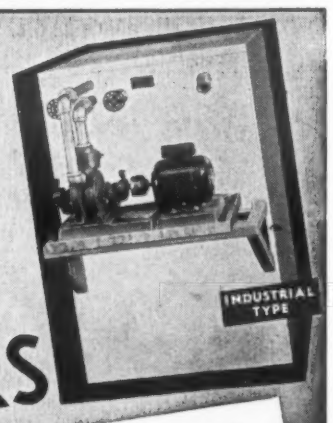


No fairy tale this: you use refrigeration units in your business only because they are essential to a profitable operation. Pump speeds, condensor tubes, suction areas, and other technical contributions to "slower speeds mean longer life" we'll leave to Brunner's factory representative to explain in detail.

Here is today's version: refrigeration units are too important for hurried selection. Slow up, take time to *compare* design and construction details. *Check* the experience of other users. Longer life comes with profitable, worry-free installations; prompt deliveries; long-lasting customer satisfaction. *Write us.* Spend a few minutes with Brunner's representative and know why plant capacities have been greatly increased.

BRUNNER MANUFACTURING CO.
Utica 1, New York, U. S. A.

Filtrine HIGH EFFICIENCY WATER COOLERS



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Several choice areas available for manufacturers' representatives.

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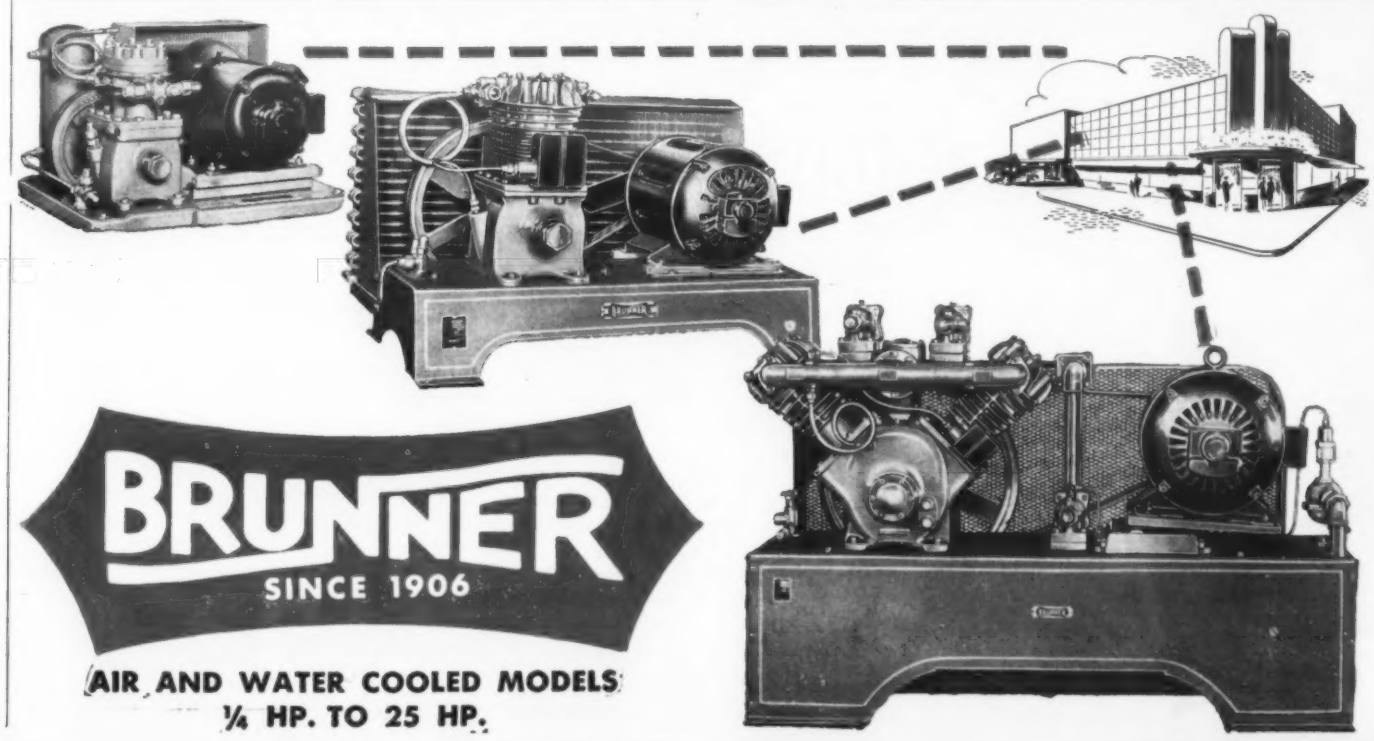
53 Lexington Ave. Brooklyn 5, N. Y.
Manufacturers of Coolers & Filters for over 40 Years



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AIR AND WATER COOLED MODELS
¼ HP. TO 25 HP.

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★The gauge with the Recalibrator

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JAS. P. MARSH CORP.
DEPT. O, SKOKIE, ILLINOIS

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Atlantic City's Hotel Of Distinction

A Hotel Planned and Designed for Your Every Comfort . . . assuring you absolute Rest and Relaxation . . . amid an Atmosphere of Refinement. . . .

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New Conveyor To Step Up Production at Ultra-Cold

LOS ANGELES—Ultra-Cold, Inc., here reports the installation of a new conveyor line in its plant to step up assembly operations on the firm's 41-S, 41-T, and 61-S line of refrigerators.

The base of the conveyor system is situated in the sheet metal department. In smooth-flowing motion, the cabinet is assembled, painted, and fitted with doors. As it moves along, the compressor unit is installed, charged, and tested—ending up in the crating department, ready for shipment. Each of the three models comes off the line at the rate of one every 20 minutes.

Display Cases In Cafe Window Draw Traffic

CHEYENNE, Wyo.—A tremendous amount of public interest as well as increased business has resulted from the recent installation of fully refrigerated window display cases at the Mayflower Cafe here, according to the management.

It is the first such installation in a Wyoming restaurant and the refrigerated space makes possible the display of perishable foods, such as lobsters, et cetera, for long periods of time without deterioration, it was pointed out.

New double windows have been installed, making the cases completely dustproof as well as providing extra insulation. The display is a magnet for pedestrian traffic.

H. F. Bell Heads List of Appointments by Servel

EVANSVILLE, Ind. — Harry F. Bell, former eastern manager of the Electric Refrigeration Division of Servel, Inc., has been named field sales manager according to W. J. Aulsebrook, Electric Refrigeration Division sales manager. Bell will move his headquarters from Boston to Evansville in the near future.

Harry F. Bell

In his new position Bell will supervise field sales personnel and cooperate with them in handling correspondence and contacts with customers in all sections of the country.

In addition to this appointment Aulsebrook also named the appointment of Curtis B. Allen as district manager in the Southeastern states, replacing W. J. McGuire who died Oct. 17.

Allen, who has had a number of years experience with commercial and domestic refrigerator distributors in the South will make his headquarters at Atlanta.

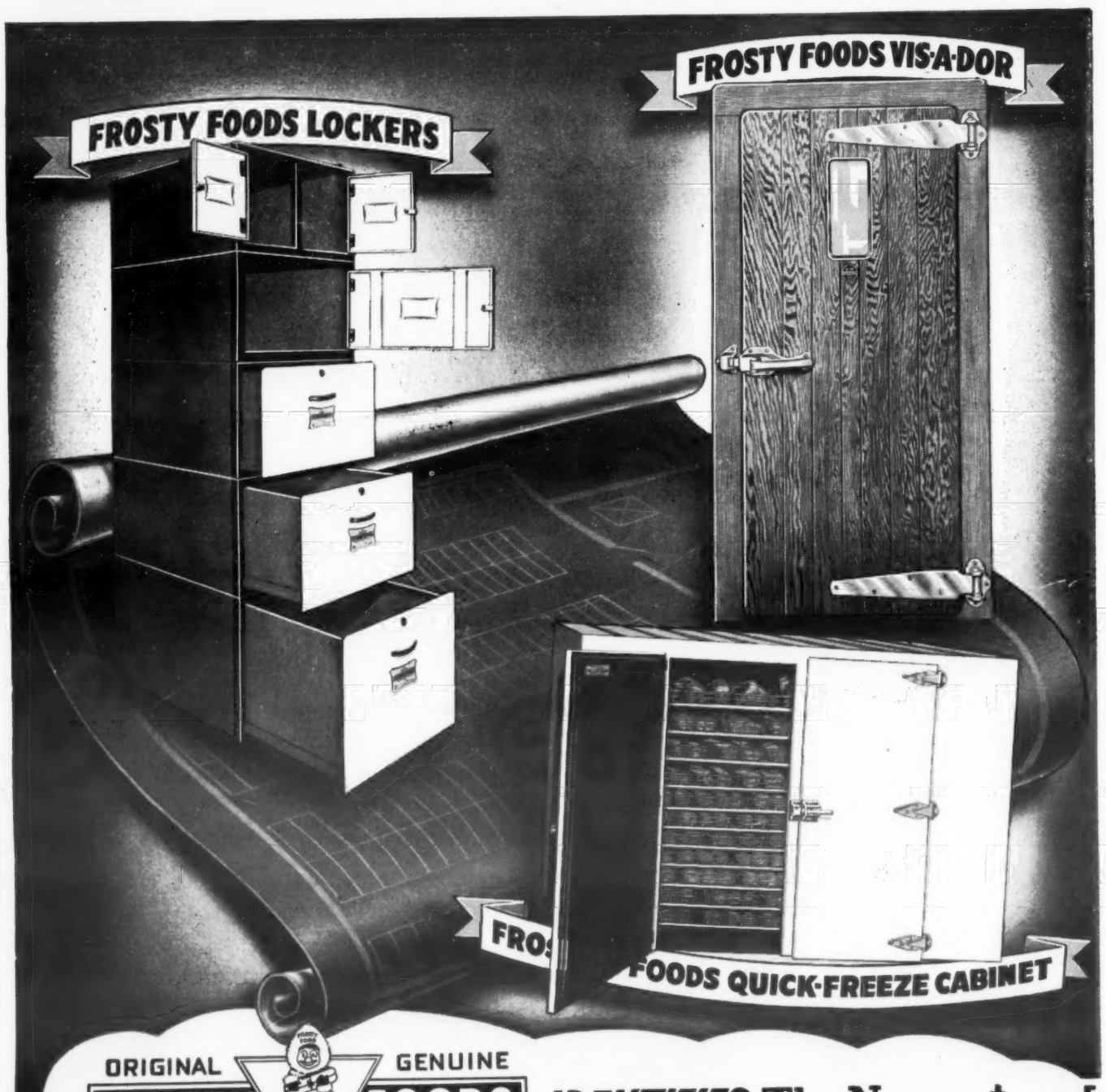
Also announced was an expansion of the application engineering department which is under the management of John Zubrod. Don Rentschler, a recent graduate of the United States Naval Academy, has joined the application engineering staff in order to render better customer service in this division.

Shipments of Heat Exchanger Equipment and Self-Contained Conditioners in 3rd Quarter

Table 2 (Cont.)—Air Conditioning Equipment and Components And Accessories for Air Conditioning and Commercial Refrigeration Equipment: Shipments by Type of Product, Third Quarter 1947

Product	Shipments of Complete Units: Total No.	Total Value (dollars)	Domestic* No.	Domestic* Value (dollars)	Export† No.	Export† Value (dollars)	No. of Plants Reporting
Centrifugal refrigeration machines (water and brine chilling), total	84	2,086,789	63	1,631,291	21	455,498	4
200 hp. and under	36	507,255	26	373,242	10	134,013	4
201 hp. and over	48	1,579,534	37	1,258,049	11	321,485	3
Heat exchanger equipment, total	....	11,946,123	....	11,056,219	....	889,904	48
Evaporative condensers, total	1,556	1,924,579	1,407	1,768,526	149	156,053	21
5 tons and under	221	56,304	180	47,526	41	8,778	10
5.1 to 7.5 tons	94	44,132	88	41,341	6	2,791	12
7.6 to 10 tons	151	90,769	142	85,039	9	5,730	14
10.1 to 15 tons	149	117,185	130	100,863	19	16,322	16
15.1 to 20 tons	104	109,949	95	98,875	9	11,074	14
20.1 to 30 tons	294	350,070	265	314,992	29	35,078	17
30.1 to 50 tons	306	504,551	286	473,412	20	31,139	16
Over 50 tons	237	651,619	221	606,478	16	45,141	15
Unit coolers, total	33,227	4,797,278	29,864	4,356,959	3,363	440,319	35
Air conditioning remote type, total	4,032	1,492,847	3,476	1,354,631	556	138,216	17
3 tons and under	2,087	201,220	1,649	163,409	438	37,811	6
3.1 to 5 tons	413	158,005	393	151,008	20	6,997	10
5.1 to 10 tons	472	234,785	458	228,354	14	6,431	13
10.1 to 25 tons	813	604,931	748	546,520	65	58,411	16
Over 25 tons	247	293,906	228	265,340	19	28,566	8
Refrigeration, total	29,195	3,304,431	26,388	3,002,328	2,807	302,103	30
Ceiling and wall mounted, total	28,116	2,263,104	25,412	2,029,213	2,704	233,891	26
1,000 B.t.u./hr. and under	635	18,002	504	15,522	131	2,480	6
1,001 to 2,000 B.t.u./hr.	6,048	292,191	5,609	272,925	439	19,226	16
2,001 to 4,000 B.t.u./hr.	4,984	229,188	4,580	205,170	404	24,018	17
4,001 to 6,000 B.t.u./hr.	3,865	237,338	3,510	212,238	355	25,100	21
6,001 to 8,000 B.t.u./hr.	3,954	318,131	3,514	279,758	440	38,373	21
8,001 to 12,000 B.t.u./hr.	3,246	355,684	3,018	329,817	228	25,867	22
12,001 to 18,000 B.t.u./hr.	3,962	517,582	3,301	432,224	661	85,358	18
Over 18,000 B.t.u./hr.	1,422	294,988	1,376	281,559	46	13,429	8
Floor mounted dry type, total	798	630,674	707	576,143	91	54,531	14
5 tons and under	303	143,811	242	115,323	61	28,488	12
5.1 to 7.5 tons	230	192,781	222	187,213	8	5,568	12
7.6 to 10 tons	139	162,730	134	156,364	5	6,366	11
10.1 to 15 tons	110	112,809	95	99,950	15	12,859	8
Over 15 tons	16	18,543	14	17,293	2	1,250	3
Floor mounted spray type, total	281	410,653	269	396,972	12	13,681	9
5 tons and under	7	5,685	6	4,828	1	857	3
5.1 to 7.5 tons	100	148,706	94	142,012	6	6,694	7
7.6 to 10 tons	39	48,824	39	48,824	....	....	5
10.1 to 15 tons	77	105,433	73	100,608	4	4,825	5
Over 15 tons	58	102,005	57	100,700	1	1,305	5
Other heat exchanger equipment, total	....	5,224,226	....	4,930,734	....	293,532	35
Condensers, shell and tube and shell and coil	....	796,435	....	687,923	....	108,512	15
Shell and tube liquid coolers	....	324,619	....	310,800	....	13,819	12
Shell and coil liquid coolers	....	48,644	....	41,980	....	6,664	5
Fin coils—heating other than forced air units	....	1,194,551	....	1,166,842	....	27,709	10
Fin coils—cooling other than forced air units	....	2,015,087	....	1,938,727	....	76,350	19
Evaporators, plate type	....	844,930	....	784,452	....	60,478	8
Section II—Self-Contained Air Conditioning Units and Ice Making Machines							
Self-contained air conditioning units, total	15,854	9,094,060	14,670	8,454,121	1,184	639,939	17
Room type, total	7,927	1,818,474	7,021	1,483,112	906	335,362	8
Window sill type	4,693	841,190	4,682	839,234	11	1,956	5
Floor type	3,234	977,284	2,339	643,878	895	333,406	5
Other than room type, total	7,927	7,275,586	7,649	6,971,009	278	304,577	15
3 tons and under	2,741	2,008,155	2,626	1,912,987	115	95,168	14
5 tons	4,471	3,909,936	4,341	3,771,040	130	138,896	13
7.5 tons	327	440,515	317	426,697	10	13,818	8
10 tons	177	371,295	167	351,292	10	20,003	7
15 tons	131	320,652	120	294,270	11	26,382	6
20 tons	34	74,500	34	74,500	....	....	4
Over 20 tons	46	150,433	44	140,223	2	10,310	4
Ice making machines	1,866	627,761	1,722	489,899	144	137,862	5

*Continental United States. †Includes Canada, Mexico, and United States territories.



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Manufacturers of
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In modern markets, Stores, Restaurants and Lunch Rooms, this is the Ideal Frozen Food Preserver and Display Cabinet.—A credit to any surroundings.

Where Freshness and appearance is important it saves unnecessary expense due to shop-worn merchandise used for display purposes.

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Write or wire now for complete dealers price list. Immediate delivery on all Standard Size Cabinets.

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10 cu. ft.
length 72 in. width 30 in. height 32 in.
16 cu. ft.
length 92 in. width 30 in. height 32 in.

Remote Installation.
16 cu. ft.
length 72 in. width 30 in. height 32 in.
24 cu. ft.
length 108 in. width 30 in. height 32 in.

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- Two ½ in. Plate Glass removable sliding doors, framed in Stainless Steel.
- Interior Lining—Heavi Gauge electric welded Steel Tank.
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How Industry Depends Upon Refrigeration

Extensive use of refrigeration and air conditioning was made by Monroe Auto Equipment Co. when it expanded its plant. Window conditioners (top left) were installed in offices; water coolers (top right) were strategically located throughout the large plant, the drafting room (shown at bottom) used unit conditioners to improve working conditions.

* * *

Manufacturer of Auto Parts Employs Refrigeration In 4 Ways to Improve Production In Plant Expansion

MONROE, Mich. — Usefulness of mechanical refrigeration and air conditioning for a variety of purposes in postwar industrial expansion programs is illustrated in the completion of the $3,500,000 program completed last year by the Monroe Auto Equipment Co., largest independent producer of hydraulic ride control equipment.

The Monroe company utilized refrigeration equipment in four phases of the company's operations.

1. Window and space air conditioners were provided in both executive and factory offices to afford comfortable working conditions in summer as well as winter.

2. Space air conditioners were provided in the engineering department offices and drafting rooms where air conditioning was deemed an important adjunct to operations, even though "cool" fluorescent lighting is used.

3. Mechanically refrigerated water coolers are situated at strategic points in the factory areas, now occupying more than 400,000 sq. ft., and these are supplemented by refrigerated vending machines for soft drinks.

4. In the newly expanded engineering department, one of the new testing machines installed is a fast-freeze unit where temperatures as low as -60° F. are used to test the efficiency of hydraulic shock absorbers for passenger automobiles, trucks, tractors, motorcycles, buses, railroad cars, and other types of transportation.

Monroe ride control products are used as standard equipment on 17 out of 20 new makes of passenger automobiles and by more than 60% of new railroad passenger equipment.

Schaefer Names Ralph Ley To Southeastern Post

MINNEAPOLIS — Ralph B. Ley has been appointed district factory representative in the southeast territory for Schaefer, Inc., handling Schaefer sales in Alabama, Florida, Georgia, North Carolina, South Carolina, Tennessee, and parts of Virginia, Kentucky, and Mississippi.

Ralph B. Ley

From 1933 to 1941 Ley did sales engineering for distributors of General Electric and Carrier Corp. During the war he served in Washington as purchasing agent in the U. S. Army Engineers Corps for refrigeration and other critical materials.

After the end of the war and until the beginning of 1947 Ley was in charge of O.P.A. pricing for all commercial refrigeration equipment, and in this capacity became thoroughly familiar with all makes and types of refrigeration.

During the past year he has had headquarters in Chicago as factory representative for Victor Products.

Nebraska University Plans Campus Hall Conditioning

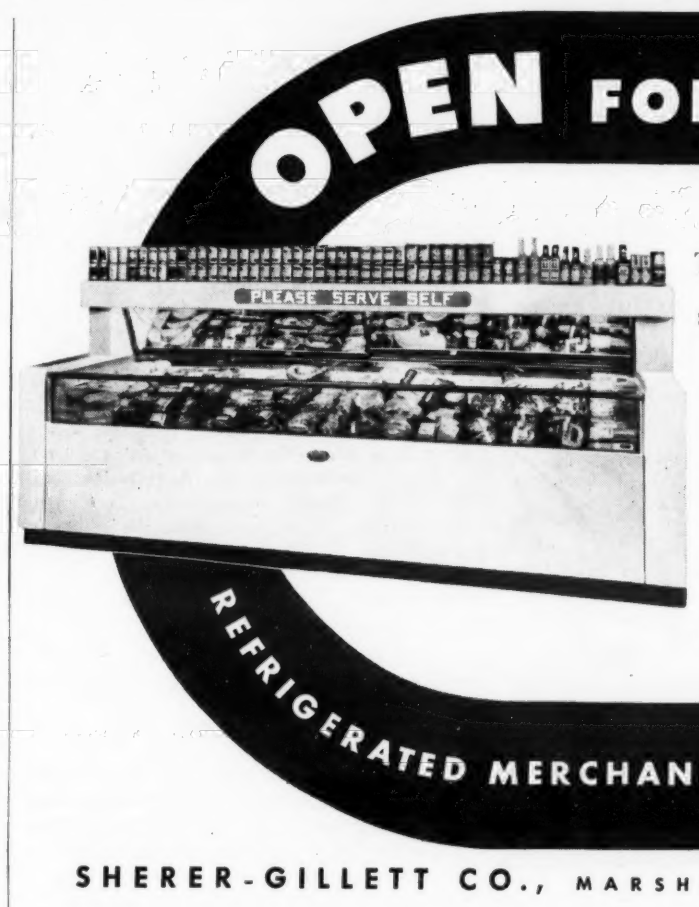
LINCOLN, Neb.—The University of Nebraska board of regents has voted to receive bids for the installation of ducts for air conditioning of Burnett hall on the university campus. Dr. Carl Borgmann, dean of faculties, reported it will cost approximately $29,000 to ready the new classroom building for air conditioning equipment to be installed this year.

Contractor Makes 1,620-Mile Service Call--For Free

BARABOO Wis.—It is no secret that refrigeration contractors go a long way to please their customers, but how many besides Arthur Waddell of Waddell Refrigeration Co. here have gone 1,620 miles for one—to render free service?

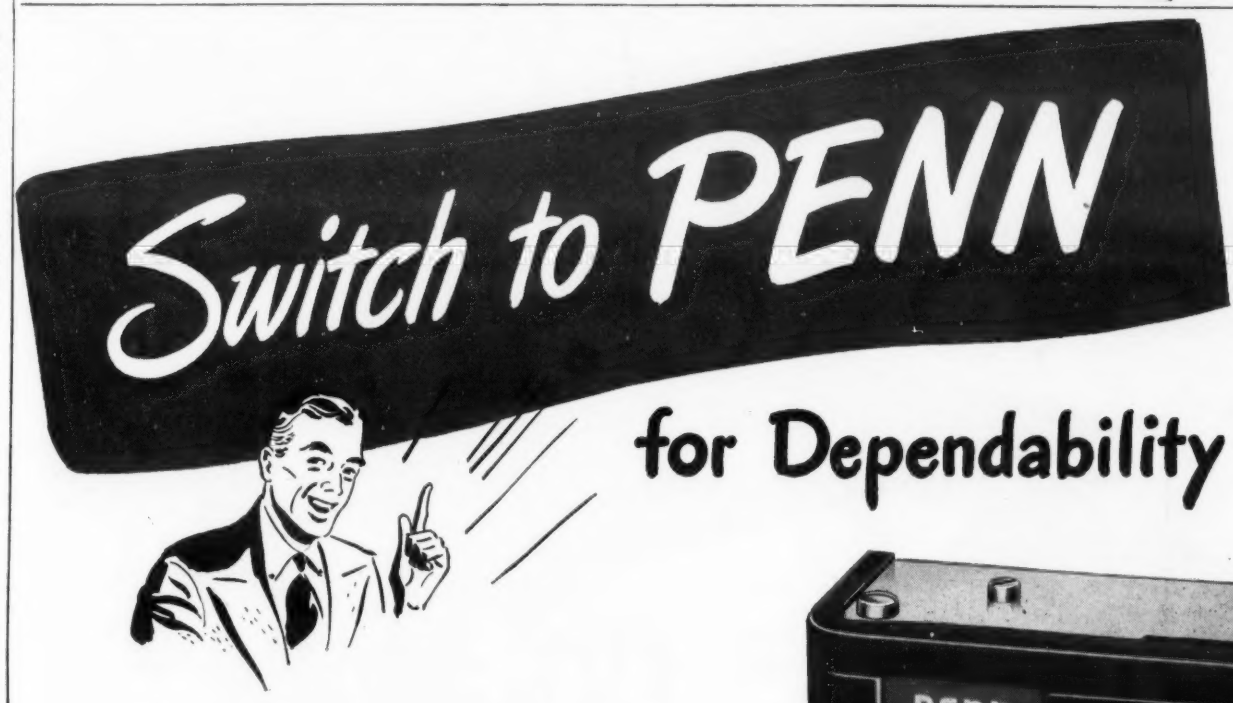
Waddell recently installed some refrigeration in the trailer of a friend who was moving to Wall, South Dakota, 810 miles away. After the friend had moved, trouble with the equipment arose and the friend wrote Waddell for advice.

Waddell told him to get a local refrigeration serviceman to fix it and send him the bill. However, the friend was not able to get a serviceman. So he suggested that Waddell take a vacation in South Dakota's Black Hills and bring his tool kit along. He did and fixed his friend's equipment, which was in warranty. Four days later he was back home.



The new Sherer open-type self service display refrigerator, for Meat and Dairy Products, is meeting the expectations of America's most discriminating food merchants. It will pay you to know more about it!

SHERER-GILLETT CO., MARSHALL, MICHIGAN



Star Features of the Penn 270

★ It's two switches in one—the first and only refrigeration control with double-pole construction—for greater versatility and protection.

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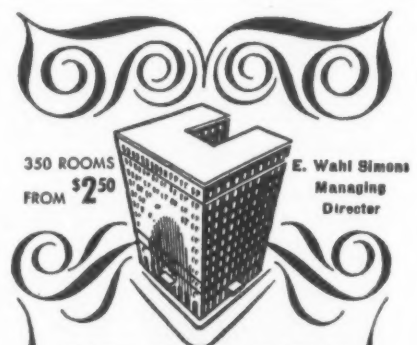

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Gloomy Weather Figures Make Dryer Chief Happy

SOUTH BEND, Ind.—"No wonder the clothes dryer business is so good; the weather's so bad!"

That opinion, backed by figures from the latest United States Meteorological (weather, that is) Yearbook, was expressed at a recent sales conference by L. F. (Jack) Worth. As manager of the dryer sales division for Bendix Home Appliances, Inc., Worth has a deep interest in the weather.

"In 180 American cities," he told the group, "there is cloudy or partly cloudy weather on an average of 70% of the time. In other words, the average number of clear days per week in these cities is only 2.07."

Further, Worth pointed out, 61 of these cities had cloudy or partly cloudy weather 75% or more of the time.

He said that Yuma, Ariz., had the most clear days—263. But the more or less pleasant weather in Arizona wasn't deterring the distributor for Bendix Home Appliances, Inc., for Electrical Equipment Co., Phoenix, is selling Bendix automatic clothes dryers here and there in the territory, and it recently received another sizeable shipment.

Vets Open Appliance Store In South Dakota City

KIMBALL, S. Dak.—A new electrical appliance store has been opened here by two veterans, Howard Payton and Harold Rank, under the name of Kimball Radio & Electric Shop.

Where Are Refrigerators? Roiled Red Demands

MOSCOW, U.S.S.R.—Comrade Ivan, with a devaluated ruble in his pocket and recently cut loose from rationing, is putting up a howl for electric refrigerators and vacuum cleaners—but he isn't getting any.

No less an authority than Y. Ganshtak, commercial director of Mostorg, largest department store here, asserts that, "Notwithstanding large funds spent on putting into production electric vacuum cleaners and refrigerators, these extremely necessary domestic machines are not being produced anywhere at present."

Ganshtak's complaint, which he uttered through the columns of the trade union newspaper Trud, is that his customers are demanding such merchandise and Soviet factories ought to start producing it.

Washing machines, too, are in strong demand, he noted. One shop, he said, turned out 300 units of a manually operated model and then quit. Those 300 were sold quickly.

Ganshtak further complained that the goods now being produced are of such inferior quality that the store has to throw away large quantities.

Rennewanz New Manager of Hotpoint Pacific Sales Area

CHICAGO—Donald W. Rennewanz has been appointed manager of the Pacific sales district, San Francisco, for Hotpoint, Inc., a General Electric affiliate. He succeeds Howard J. Scaife, recently announced as moved to a newly created position, manager of market development. Rennewanz first joined Hotpoint in 1938. In 1945 he was sales manager of the range division.

D. W. Rennewanz

In his new assignment Rennewanz is responsible for all sales activities in the 11 western state area.

Kilbey, Hissick Named to G-E Home Laundry Posts

BRIDGEPORT Conn. — The appointment of Harry Kilbey as manager of the Trenton works of the General Electric Co.'s home laundry equipment division and of William M. Hissick as superintendent of the Bridgeport section of the division has been announced by Harold Sargeant, division manager of manufacturing.

Kilbey, formerly superintendent of manufacturing of the home laundry equipment division, joined General Electric at Bridgeport in 1921.

Hissick came to the company at Bridgeport in 1925. He has been general foreman of the home laundry division since 1942.

Dealer Groups Pick Officers, Directors

SPOKANE, Wash. — Officers and directors of five chapters of the Inland Empire Electrical Dealers Association for 1948 were recently announced by Robert L. Wilkinson, executive secretary of the association.

Election of the new officers for the Spokane chapter were reported separately in the Dec. 1, 1947 issue of the NEWS. The others follow:

Big Bend chapter: President—Earl Synder, Snyder Electric, Washtucna; vice president—Ray Souther, Ritzville Trading Co., Ritzville; secretary—Fred J. Williams, Washington Water Power Co., Davenport; treasurer—Fred W. Denson, Denson Hardware, Davenport.

Directors are: Ted Bonk, Edgren & Cox, Sprague; Berdell Hose, Radio Electric Co., Wilbur; Henry Michaelsen, Jr., Michaelsen's Mercantile, Odessa; and Winn Self, Odessa Tractor & Implement, Odessa.

Coeur d'Alene chapter: President—R. W. Burch, Burch's Furniture; vice president—Claude Whiteley, Whiteley's Electric; secretary-treasurer—Gordon F. DeFoe, Washington Water Power Co.

Directors are: Earl N. Dawson, Cope Electric Co.; Robert Defenbaugh, Koenig-Kennedy, Inc.; Hedley Dingle, Dingle Hardware; O. H. Lawrence, Powerhouse; and George Neilson, North Side Feed & Hardware. All officers and directors are from Coeur d'Alene.

Lewiston chapter: President—John Nanniga, John's Electric Shop; vice president—Dewey Scheibe, Erb Hardware; secretary—J. J. Fox, Washington Water Power Co.; treasurer—Harley Steiner, Steiner Radio & Appliances. All are from Lewiston, Ida.

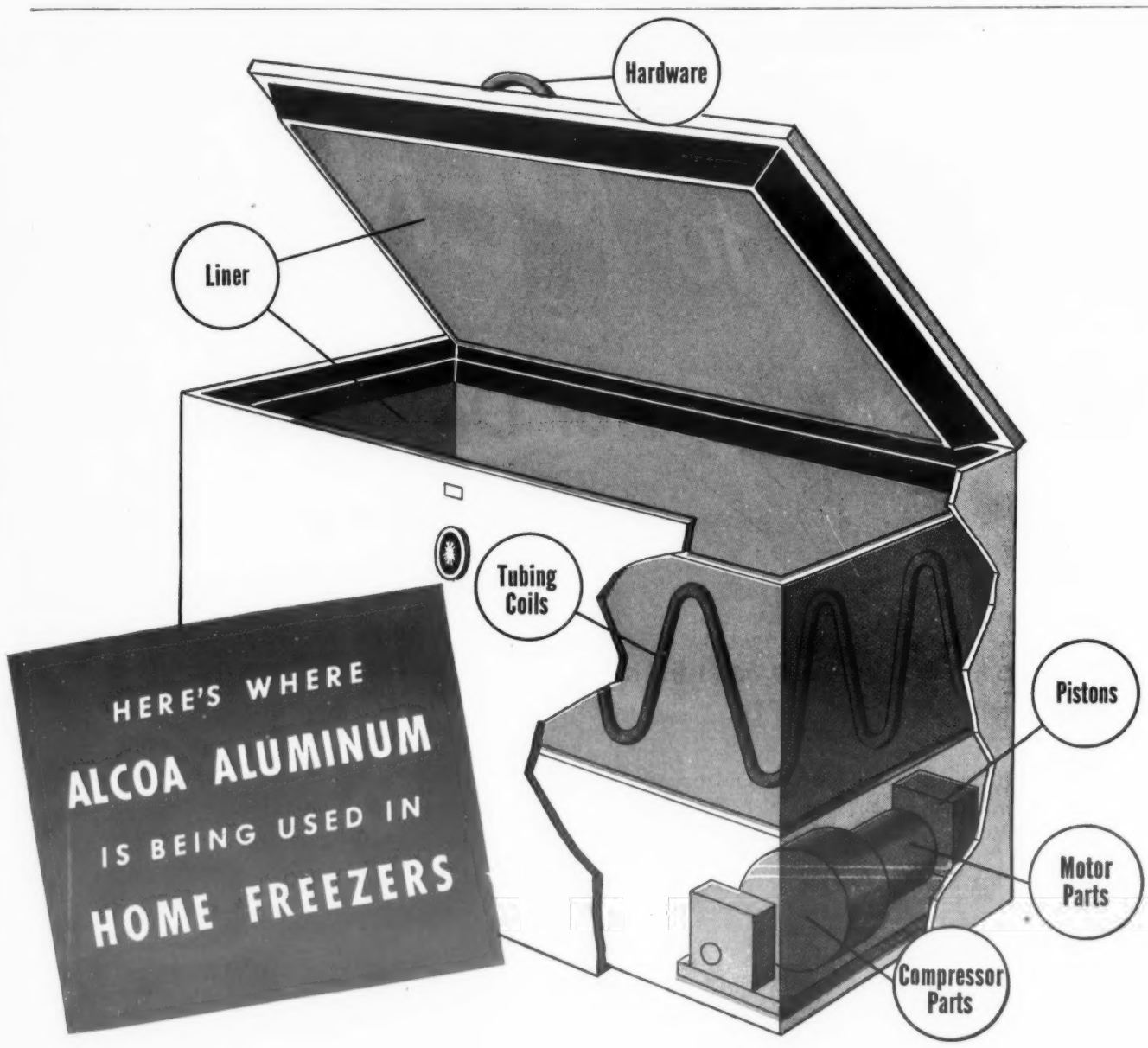
Directors are: Joe Clovis, Craigmont Hardware Co., Craigmont, Ida.; Ed Jones, Ed Jones Home Supplies, Grangeville, Ida.; Melvin Stewart, Lewiston Refrigeration Service, Lewiston, Ida.; and Harold Stoddard, Stoddard Electric, Orofino, Ida.

Palouse chapter: President—S. C. Haddock, Haddock's Electric, Moscow, Ida.; vice president—Eldon T. Strom, Strom Electric Co., Troy, Idaho; secretary—L. A. Winn, Washington Water Power Co., Pullman, Wash.; treasurer—A. T. Olson, Tate Electric, Pullman, Wash.

Directors are: Claude Edgren, McEuen & Edgren, Colfax, Wash.; Charles Fanning, Fanning Implement & Hardware, Oakesdale, Wash.; Martin Holter, Brown & Holter Co., Pullman, Wash.; and O. T. Ward, Palouse Electric, Palouse, Wash.

New Elmira Furniture Firm Handles Full Appliance Line

ELMIRA, N. Y.—Dreamhouse Furniture Co. has been opened at 206-208 E. Water St., handling a complete line of appliances. It is owned and operated by Louis Robbins.



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*Process patented

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Using Proper Valve for Each Application of Evaporator Solves Many Service Problems

By F. M. MacDougall, Chief Engineer, Alco Valve Co.*

Freedom from trouble with automatic controls rests squarely upon a clear understanding of application and maintenance, application being of greater importance. Proper application in turn depends upon two factors,

(1) The function and limitations of each type of control device, and

(2) The characteristics of the evaporators to be controlled (the scope of this paper is limited to evaporator controls).

As for maintenance, the old adage of "an ounce of prevention"—is particularly applicable. Keeping the refrigerant *in* and the moisture *out* are of paramount importance.

To fix clearly in mind these points, a review of the basic types of evaporators and automatic controls is in order. The largest and most important group of controls is liquid expansion valves. Their basic function is to expand liquid refrigerant into an evaporator at the maximum rate that can be evaporated without flood-back to the compressor. The types are the constant-pressure, high-side float, low-side float, and thermostatic.

The constant-pressure expansion valve maintains a constant evaporating pressure, which makes it suitable only for systems which have only slight variations in load. This fact coupled with limitation to use on single-evaporator systems only has made this device almost obsolete.

The high-side float valve expands refrigerant at the same rate that it is condensed, keeping the receiver almost completely drained at all times. Other than being limited to single-evaporator circuits and requiring a critical charge in the system, it is a very satisfactory control for flooded evaporators. A float switch may be used for the same purpose by maintaining a low level in the receiver. The switch controls a solenoid valve in the liquid line, most of the expansion being taken across a manual expansion valve between the solenoid valve and evaporator.

The low-side float valve, as its name implies, maintains a constant level in an evaporator, or in an accumulator connected to an evaporator. It may be used in parallel with other evaporators. It is efficient in that all of the evaporator is flooded with refrigerant, but difficulty may be encountered in "Freon" systems with oil-return to the suction line. A float switch may be used in the same manner, controlling a solenoid valve in the liquid line.

The thermostatic type comes nearest to being the universal automatic control for liquid refrigerant expansion. It responds to both the evaporating pressure and the temperature of the gas leaving the evaporator to maintain a constant superheat at the evaporator outlet. Inasmuch as operation depends upon superheating the refrigerant gas a few degrees, a portion of the evaporator must be operated at a relatively low efficiency to produce this superheat.

The thermostatic valve more than makes up for this shortcoming by its versatility, adaptability, compactness, and positive operation. It may be applied to any type of evaporator and in parallel with other evaporators. Its adaptability is best illustrated by the valves that limit the evaporating pressure in addition to performing the normal function of superheat controls.

The positive operation is assured by the equilibrium of three large forces, the force above the diaphragm, the force below the diaphragm, and the spring. When a load change upsets one of these conditions, a powerful restoring force shifts the valve needle to provide the proper change in refrigerant flow.

For best application of automatic liquid expansion controls to evaporators, two distinctions must be made between ammonia and "Freon."

The first is that "Freon" has a relatively low latent heat of evaporation, requiring proportionately greater rates of refrigerant flow.

The second is that oil is lighter than liquid "Freon" and heavier than liquid ammonia; coupled with this fact is the miscibility of oil and "Freon," resulting in a relatively large amount of oil in circulation throughout a "Freon" system.

In view of the foregoing facts, it generally is advisable to use flooded evaporators with ammonia, and dry-expansion evaporators with "Freon." In ammonia coils, the refrigerant velocity usually is low, which is conducive to bottom feed and long evaporator circuits. See Fig. 1. The small amount of oil which gets into the low side sinks to the bottom where it is readily drained out.

The velocity in a "Freon" evaporator usually is high enough for

(Continued on next page)

*Paper presented before the National Convention of the National Association of Practical Refrigerating Engineers.

Flooded Evaporators Advisable with Ammonia

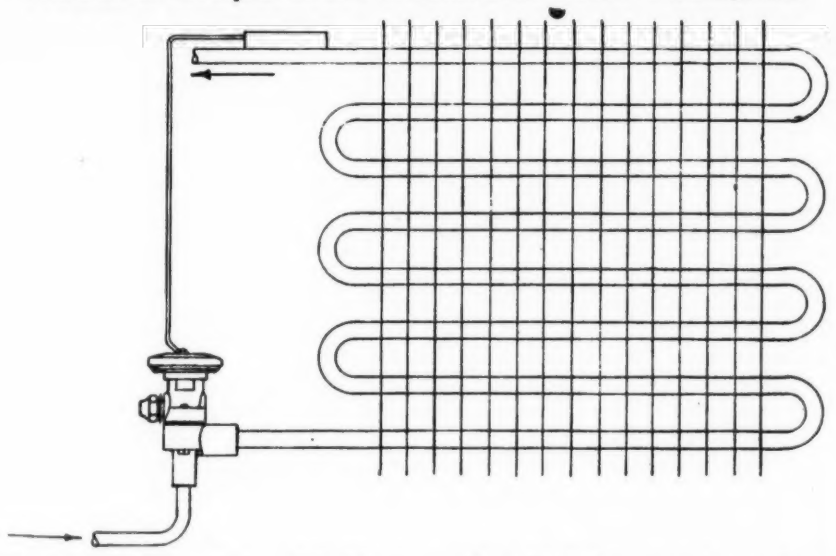
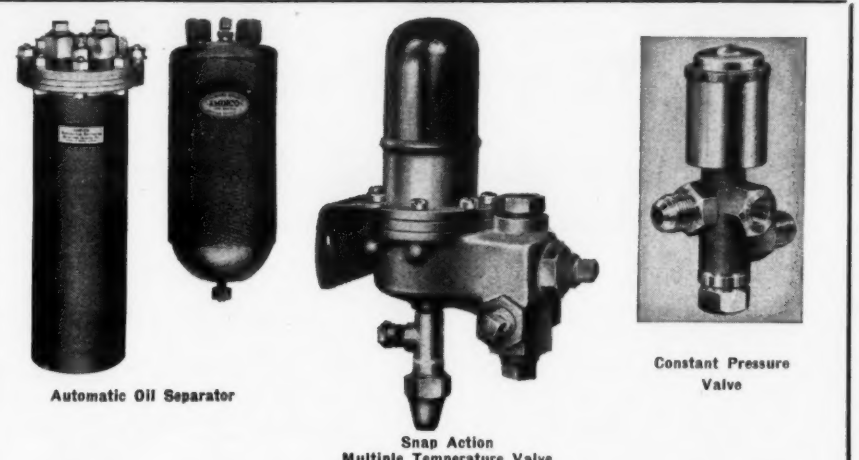


Fig. 1—Generally, it is advisable to employ flooded evaporators when using ammonia, and with low velocity of the ammonia, bottom feed and long refrigerant circuits are permissible.



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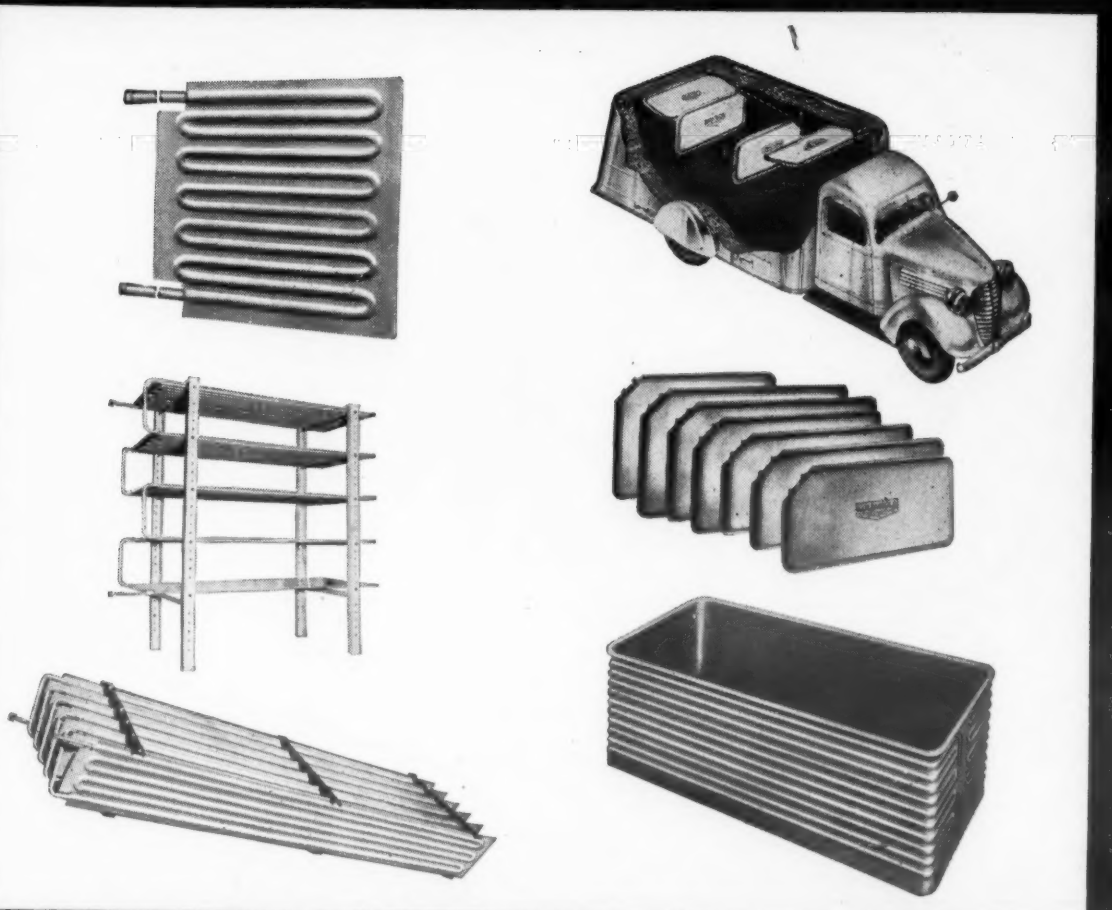

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AIR CONDITIONING & REFRIGERATION NEWS

Action of Oil--

(Continued from preceding page)

proper dry-expansion operation; in fact, most of the evaporators are multi-circuit and relatively short to avoid excessive velocity and pressure drop, as in Fig. 2. The oil readily flows through the evaporator and into the suction line where it is easily carried back to the compressor.

Flooded evaporators, such as the shell-and-tube cooler in Fig. 3, are very satisfactory with ammonia as the refrigerant. A low-side float switch is shown as the automatic control. The separator is good insurance against liquid floodbacks.

When such a cooler is used with "Freon," oil tends to accumulate on the surface of the liquid "Freon" unless a dangerously high liquid level is maintained.

If a flooded evaporator cannot be avoided on "Freon," the best control is a thermostatic expansion valve, as shown in Fig. 4. A heat exchanger must be used beyond the bulb to assure no liquid getting back to the compressor at any time.

If such a flooded cooler is the only evaporator in the system, a highside float valve or switch may be used with either ammonia or "Freon." The separator is not needed as the liquid level is high only at maximum load. With the proper quantity of charge in the system, there is no danger of flood-back. Bottom-fed coils also may be controlled by high-side float valves, as in Fig. 5.

Summarizing, application recommendations for expansion valves are:

Flooded evaporators:

(1) High-side float valve or switch for single-evaporator systems.

(2) Low-side float valve or switch for ammonia.

(3) Thermostatic expansion valve.

Dry-expansion evaporators: Thermostatic valve.

Many of the troubles encountered with expansion valves are common to all types. The difficulties most frequently encountered are insufficient or no flow, unstable control, and liquid flood-back.

Insufficient flow, or no flow, most frequently is caused by the valve needle and orifice being fouled. The cause may be dirt resulting from no strainer or from a coarse-mesh screen.

It also may be caused in ammonia systems by congealed oil, and in "Freon" systems by moisture freezing at the point of expansion.

Insufficient flow may be caused by gas in the line ahead of the valve, resulting from an undersized line, strainer, dehydrator, or solenoid valve. Gas is also caused by a dirty strainer, insufficient refrigerant charge, or loss of static head resulting from the valve being installed considerably above the receiver.

Another cause of insufficient flow is an incorrect adjustment of the valve. The pressure may be set too low on a constant-pressure valve, or the superheat may be set too low on a thermostatic valve.

Improper application accounts for some complaints of insufficient flow. A constant-pressure or thermostatic valve may need an external equalizer because of high pressure drop through the evaporator, or a pressure-limiting thermo valve of too low

(Continued on next page)

Most 'Freon' Evaporators Are Multi-Circuit

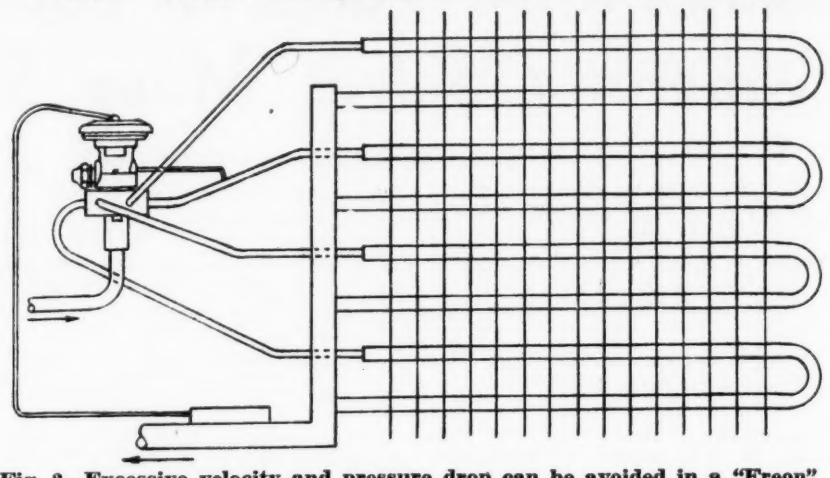

Fig. 2—Excessive velocity and pressure drop can be avoided in a "Freon" dry expansion evaporator by means of the multi-circuit design such as diagrammed above.

Low Side Float Switch Controls Ammonia Coil

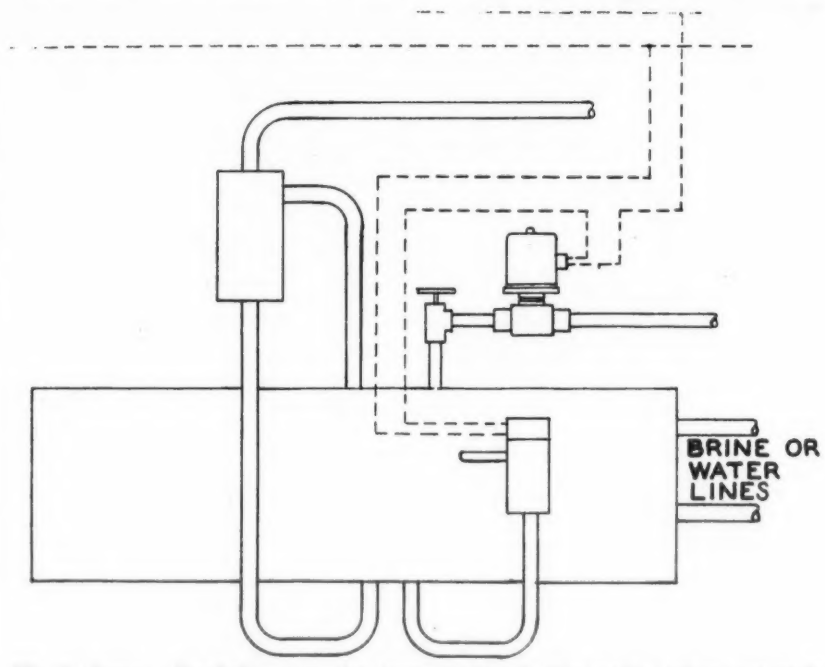

Fig. 3 shows a flooded evaporator type shell-and-tube cooler using ammonia. A low side float switch serves as the automatic control.

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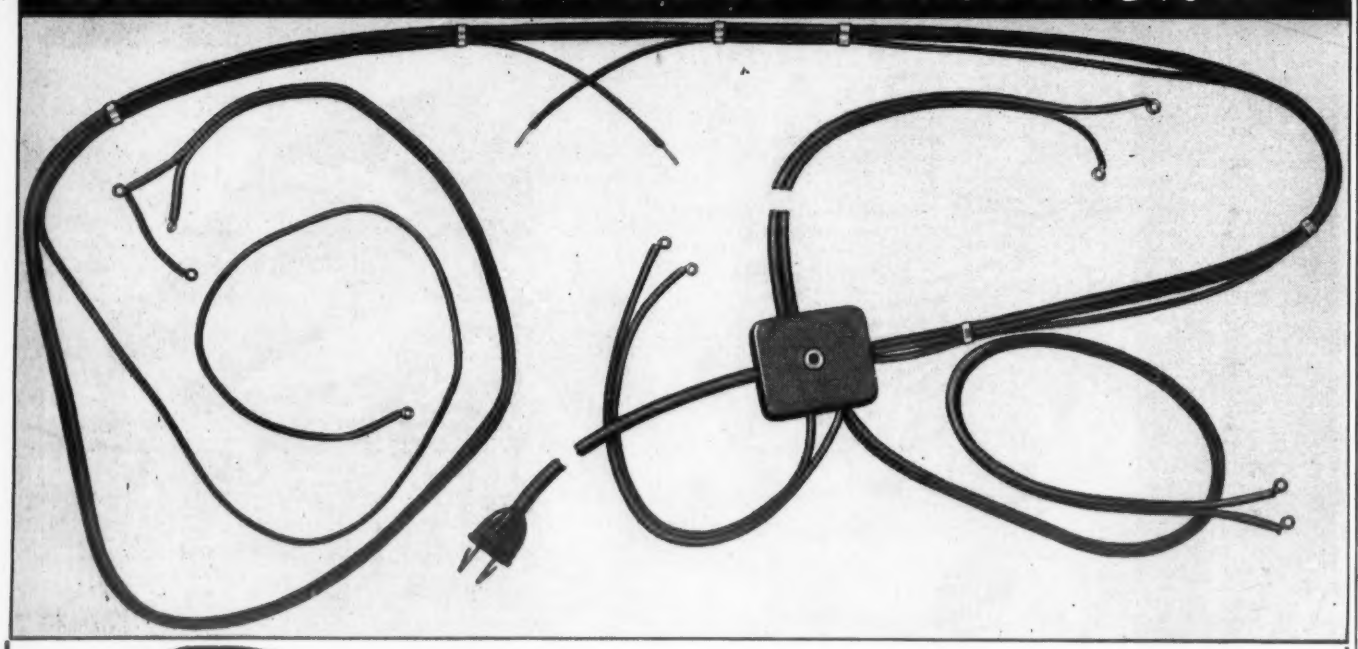

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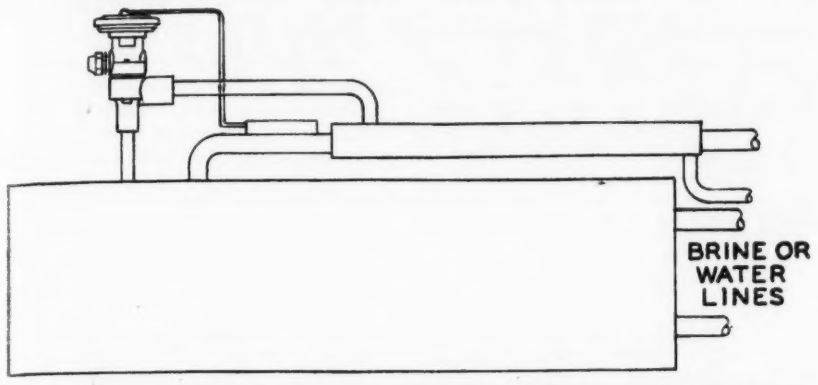

Fig. 4 shows a flooded "Freon" evaporator which is controlled by a thermostatic expansion valve. Note the heat exchanger installed beyond the bulb to insure that no liquid gets back to the compressor.

Misapplication of Valves May Lead to Numerous Troubles for the Serviceman

(Continued from preceding page)

a pressure may prevent the suction pressure from rising high enough.

Low-side float valves or switches may be installed too low on the accumulator, which, in addition to preventing adequate flooding of the evaporator, aggravates the operation on "Freon" by accumulating oil in the low side.

Unstable control, also known as "hunting," is the alternate feeding of too much and too little. This action impairs the evaporator efficiency and increases the tendency of the compressor to pump oil. The most common general cause is an oversized valve (in the case of a float switch, the manual expansion valve may be open too wide). If the control is a thermostatic valve, an additional cause is an incorrect superheat setting, usually too low.

The other general cause of hunting is improper application of the automatic control. A low-side float valve or switch float chamber may be uninsulated when installed in a warm location. In addition to the refrigeration loss incurred by the absorption of heat by the float chamber, the resulting ebulition disturbs the float sufficiently to create erratic operation.

Constant-pressure and high-side float valves sometimes are installed in parallel with other automatically-controlled evaporators, with unpredictable results.

The most likely misapplication of thermo valves is placing the remote bulb on a trapped portion of the suction line or just beyond a trap. Also, where a liquid-to-suction heat exchanger is used, the bulb should be placed between the evaporator and heat exchanger; placing the bulb on the compressor side is conducive to unstable control.

Where a thermo valve is installed inside the refrigerated space, other than air conditioning, trouble is likely to be encountered with gas-charged valves. When the diaphragm or bellows becomes colder than the bulb, the thermo charge is condensed above the diaphragm or bellows, and the bulb loses control. Therefore, care must be used in the application of gas-charged valves other than on air conditioning applications.

Liquid flood-back to the compressor naturally is likely to occur at light load where the needle and seat have been eroded, usually by gas in the liquid line or a particle of dirt on the seat which prevents the valve from closing tight at no load. Unstable control, as described above, is likely to permit intermitten slugs of liquid to enter the suction line.

Also, just as incorrect adjustment may restrict the refrigerant flow below the desired rate, a high pressure setting on a constant-pressure valve or a low superheat setting on a thermo valve may permit liquid to enter the suction line.

Another source of improper adjustment may be a manual expansion valve opened too wide when used in conjunction with a float switch and solenoid valve.

Improper application also may cause flood-back, such as a low-side float valve or switch being installed too high on the accumulator. Such an installation is especially susceptible to flood-back when the compressor is started or when the load is suddenly increased on the evaporator.

Another cause of temporary flood-back after a load increase or beginning of a cycle is the failure of a constant-pressure or thermo valve to shut off at no load. The remedy may be an external equalizer or a better bulb location for the thermo valve.

Also, a thermo valve bulb may be warmed during the off-cycle by conduction from the ambient temperature, the remedy being insulation of the bulb or moving the bulb to minimize conduction along the line from the ambient temperature.

Solenoid valves, second in importance only to expansion valves, are used frequently in liquid and suction lines and occasionally in hot-gas lines. They are of the packless type and usually closed with the current off and fully open with the solenoid coil energized.

Their function is to interrupt or permit refrigerant flow in response to pressure switches, thermostats, motor starters, float switches, etc.

Solenoid valves are relatively trouble-free because of their simple construction. There are several sources of trouble, however, resulting in the valve failing to open or to close.

Failure to open may be caused by poor switch contacts or low voltage. In either case, there is insufficient solenoid power to open the valve. Most solenoid valves are cracked off the seat by the impact of a rapidly rising plunger striking a collar on the valve stem. If the force of this initial impulse is dissipated without opening the valve, a subsequent increase in voltage will do no good unless the valve is first de-energized and the plunger permitted to drop.

Another cause of low voltage during the opening of the valve is making the electrical connection to the motor side of the motor starter. The momentary reduction in the line voltage when the motor is energized is sufficient to rob the solenoid valve of sufficient voltage for proper operation.

On valves of the pilot-valve and piston type, failure to open may be experienced when the valve is installed in a considerably undersized line. When the valve is energized, the valve would open long enough to permit refrigerant flow. The undersized line has so much pressure drop that the valve inlet pressure is suddenly reduced, sucking the piston back down on the seat. The effect

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High Side Float May Control Bottom-Fed Coils

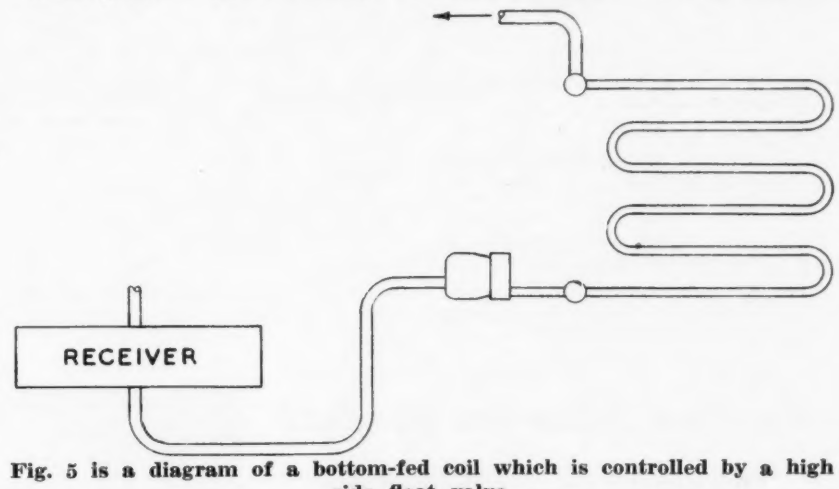

Fig. 5 is a diagram of a bottom-fed coil which is controlled by a high side float valve.

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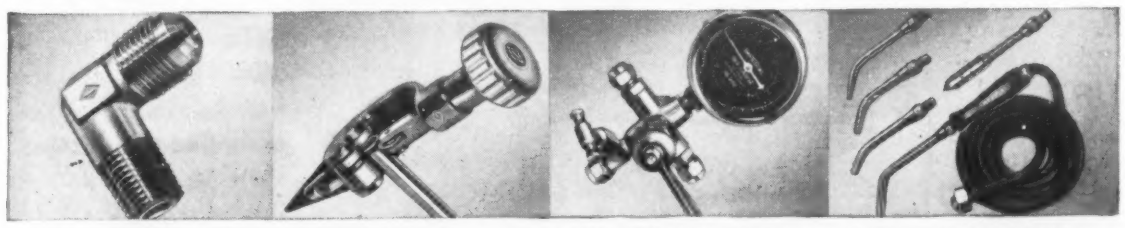

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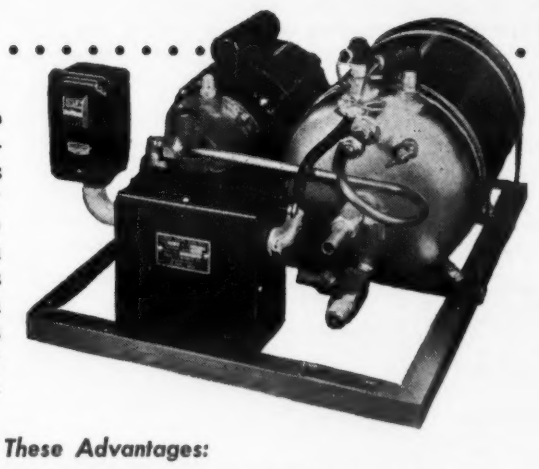

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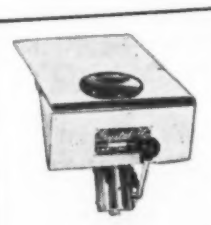

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Factors In 'Apparent' Failure of Valves

(Concluded from preceding page)

of the plunger impact is lost, so the valve cannot reopen.

This effect is aggravated where the solenoid valve is followed by an oversized expansion valve of either the manual or automatic type.

Failure to open occasionally results from the pressure differential across the valve exceeding the valve rating. However, this is an unlikely source of trouble because solenoid valves will operate at the rated pressure differential at less than the rated voltage. For failure to occur from this source, high pressure differential must coincide with low voltage.

In the normally-closed type of valve, failure of the solenoid coil naturally will prevent the valve from opening. If the coil fails because of a defect, the most likely cause is low resistance to moisture infiltration.

However, more likely sources of coil failure are high voltage, low frequency on a.c. failure of the valve to open, or high ambient temperature. Any of these factors results in excessive temperature of the coil with the consequent danger of the coil burning out.

The effect of high voltage is self evident, but it should be explained that the lower the frequency for a given voltage, the greater should be the resistance of the coil.

Failure of an a.c. valve to open results in the plunger failing to rise far enough to complete the magnetic circuit. With the magnetic circuit uncompleted, the solenoid draws excessive current and overheats the coil.

Solenoid coils for d.c. usually have a great many turns of fine wire. When the electrical circuit is interrupted to close the valve, the magnetic field collapses and induces a high voltage in the many turns of wire in the solenoid coil. If a surge protector is not provided or connected properly, puncture of the coil insulation may result.

Surge protectors usually are not required on low voltage d.c. because of the relatively fewer number of turns of wire in the solenoid coil.

Evaporator pressure regulators are used in suction lines to maintain constant evaporating pressures. This function indirectly maintains high humidities, prevents coolers from freezing, etc. Troubles are infrequent, but there occasionally is trouble from unstable control or excessive pressure variation with loads.

Unstable control almost invariably is caused by the valve being too large, which is a characteristic in any oversized automatic control. Trouble also may result from improper application. If the evaporator is controlled by a constant-pressure expansion valve, trouble is bound to result because both controls have the same function, i.e., maintaining a constant evaporating pressure.

Unstable control also may result from a short-circuit, dry-expansion evaporator controlled by a thermostatic expansion valve. In such a case, there is very little refrigerant in the evaporator, which causes the evaporating pressure to change *simultaneously* with a change in refrigerant flow.

Inasmuch as both the thermostatic expansion valve and the evaporator pressure regulator respond to the evaporating pressure, one control may upset the other where there is no lag between a flow change and an evaporating pressure change.

However, this does not mean that evaporator pressure regulators should never be applied to dry-expansion evaporators controlled by thermostatic expansion valves.

Excessive variation of pressure with load is one way of stating that the regulator does not hold the pressure constant as the load changes. If the regulator is installed remotely from the evaporator, there may be sufficient pressure drop in the suction line between the evaporator and regulator to warrant the use of an external equalizer line. Otherwise, there is little likelihood of misapplication.

For any control device to regulate flow properly, the pressure differential across the regulator is a necessity.

Most evaporator pressure regulators require a minimum pressure differential of 2 p.s.i., and some types will not control at evaporating pressures below 2 or 3 p.s.i.

Where the suction pressure rises to within 2 p.s.i. of the evaporating pressure, variations are likely in the evaporating pressure. Also, it is important with some regulators not to try to set the pressure near atmospheric or below. Therefore, the suction pressure should be watched where there are variations in the evaporating pressure.

Refrigerant automatic controls require no routine maintenance. If the system is kept adequately charged with refrigerant and free from leaks, air, moisture, and other foreign substances, the controls require no attention other than the occasional cleaning of strainers, cleaning electrical contacts, and attending to other items separate from the controls.

Before any system or portion of a system is placed in operation, it should be checked carefully to make certain that there are absolutely no leaks and that all moisture and air have been removed.

In a small system which operates at evaporating temperatures of -20° F. and warmer, a dehydrator in a "Freon" liquid line will remove the moisture, provided there is not a great deal to be removed.

In an ammonia system, moisture is a source of corrosion, but it is not likely to freeze up the expansion valve.

For systems intended to operate at pressures below atmospheric, these precautions are especially important. If a system will not hold a vacuum over night it is *not tight.*

Likewise, if the pressure is not reduced below the pressure corresponding to the saturation temperature of water vapor, it is *not dry.* For example, if the ambient temperature is 70° F., the pressure in the system must be reduced to a vacuum of 29.64 in. (30 in. barometer reference) before the water vapor is removed from the system.

Applying heat to a *portion* of the system at a time is useless because the vaporized moisture readily condenses in a cooler part. For low-temperature systems, a vacuum pump is highly desirable for removing the air and moisture. If the system is made absolutely tight and *all* of the moisture and air are removed with the vacuum pump, many perplexed hours of trouble shooting will be avoided.

Oils have been blamed unfairly for dewaxing in such systems, whereas it was the presence of moisture that precipitated the oil trouble. If a good brand of oil is used in a completely dry system, no trouble will be encountered.

During any maintenance operation, it naturally follows that every precaution should be taken against moisture entering the system. Dry refrigerant and lubricating oil should be used.

If any part of the system must be opened while under a vacuum, the air should be pumped out before reconnecting to the remainder of the system.

A clear understanding of the function and limitations of each type of automatic control, and the characteristics of the various refrigerants and evaporator types should permit the proper selection and application of refrigerant automatic controls. Such systems should give trouble free operation if the system is kept absolutely tight and thoroughly dry.

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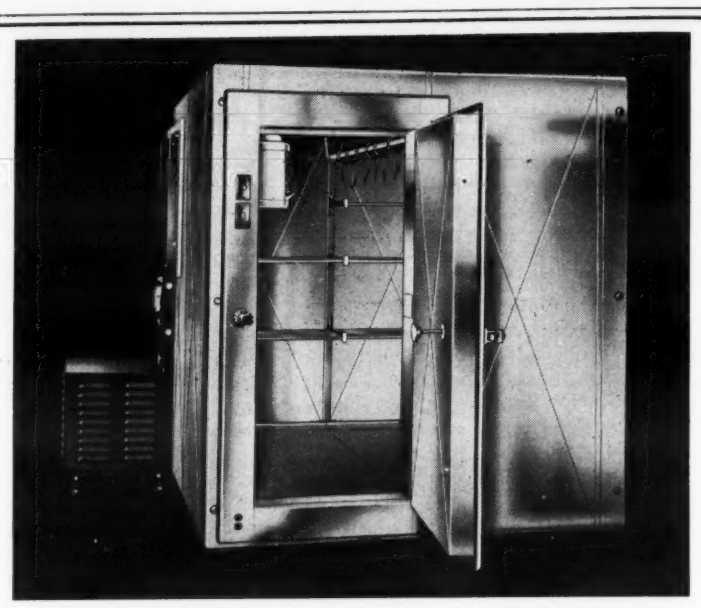

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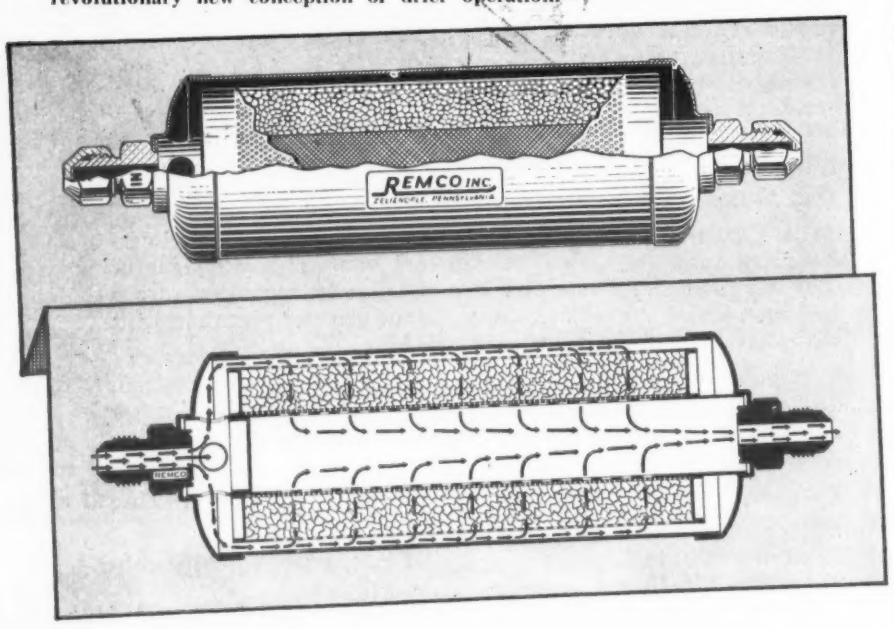

Look at the above diagram . . . follow those arrows . . . see the slow flow of the refrigerant ACROSS the thin cylindrical bed of drying agent and through the extra large, highly-efficient fine filter. You'll see the answer, in a nutshell, to "CROSS-FLO'S" efficiency.

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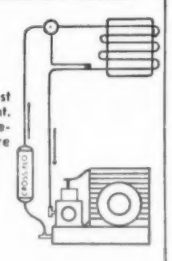
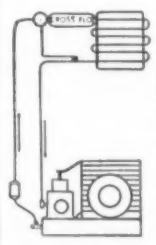
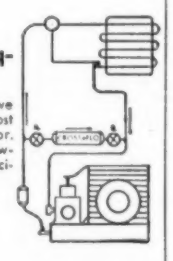
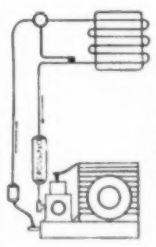




Between Refrigerant Control and Evaporator?
At this location the refrigerant temperature is lowest and the efficiency of the drier highest. CROSS-FLO is ideal for this location—use with a filter in the liquid line to keep out foreign matter.

In By-Pass Between Liquid and Suction Line?
Open valve B all the way. Open valve A slightly and regulate it to keep frost line between drier and compressor. CROSS-FLO takes full advantage of low-temp refrigerant—becomes very efficient in this installation.





In the Suction Line?
Because of the exclusive CROSS-FLO design, REMCO Heavy-Duty may be installed in the suction line on all sizes, up to and including the size of connections on the drier, without pressure drop. And . . . CROSS-FLO may be left in the suction *permanently.*

For answer to these and other everyday refrigeration problems write for additional free information and literature. Request Circular 711-A, Remco, Inc., Zelienople, Pa.

At Sacrifice Prices

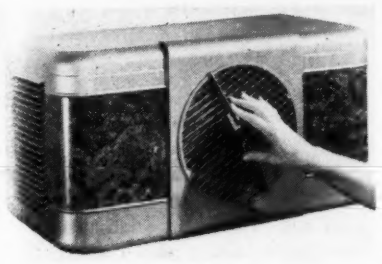
- 5-Ton McQuay Suspended Type Air Conditioner
- 1-Ton, 1½-Ton, and 2-Ton Suspended Type Comfort Coolers, Complete with Valve and Speed Control
- Mills Remote Type Condensing Units, 7½ H.P., 5 H.P., and 3 H.P., 3-Phase, Water-Cooled, Complete with Starter.
- Kramer Thermobanks, TV-75, 103, 150, 275

Also Unit Coolers, Cold Plates, Fractional H. P. Air and Water Cooled Units.

These units are priced at a special low for quick clearance. It will be worth your while to write us NOW for full details.

BOX 2658
Air Conditioning & Refrigeration News

What's New



* * *

Window Unit Movable Grill Changes Direction of Wind

BUFFALO—Fedders-Quigan Corp. here has recently developed new ½-ton and ¾-ton room air conditioners, equipped with the airotor grill, which it is claimed will direct cool air up, down, or in any desired direction by the twist of the wrist.

Designed principally for window sill installation, the directional control of the air flow makes the units suitable for mounting in transoms, high windows, or other locations, according to the manufacturer.

These units are said to cool, dehumidify, filter, ventilate, and distribute either outside or room air.

Pocket-Size Sealed Unit Tester Added by Airserco

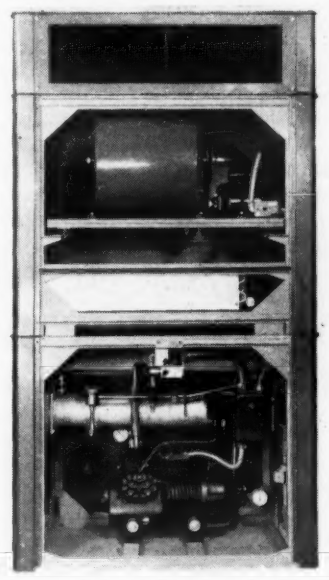
* * *

PITTSBURGH—A new low-priced, pocket-sized hermetic unit analyzer has been introduced by Airserco Mfg. Co. here. The product, known as the "Start-O-Metic" analyzer, combines both capacity and split-phase starting.

Continuity testing, manual starting, voltage testing, external capacity of 80 to 200 mfds., and other tests are also possible with the instrument. The analyzer is also capable of starting and testing units up to ½ hp. The kit-size instrument may also be left on the job for service in an emergency.

The analyzer weighs 2¼ lbs., and is 5 x 4 x 3 in., said to be the smallest full-range refrigeration analyzer on the market today.

3 Package Air Conditioners Join 'Ameri-therm' Line

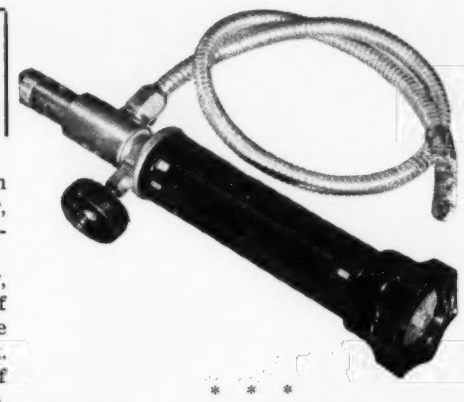


* * *

DETROIT — Three new packaged air conditioners, each powered by a sealed compressor, have been added to its line by American Thermal Industries, Inc.

The three new units are of 3, 5, and 10-ton capacity, and are equipped with Servel sealed compressors.

Among the special features claimed for the "Ameri-therm" line is a "slug-proof" control system said to provide positive assurance of unloaded starting with no liquid slugs.



* * *

Halide Leak Detector Has Only One Moving Part

CHICAGO — A new leak detector for refrigeration units has been announced by the Justrite Mfg. Co.

This new unit—the Justrite Leak Detector Outfit, Model 1240—is designed to burn alcohol.

This leak detector is reported to be a compact unit designed primarily to locate leaks in refrigeration systems using halide gases. And this model may also be used as a soldering iron and as a blow torch—soldering point and flame reducer are included in the outfit.

The height of the unit is 11 in. and the weight is 1¾ lbs. It is cylindrical in shape—the handle enclosing the fuel tube being constructed of bakelite. The brass burner tube accommodates the removable flexible metal leak detector hose. The only moving part on the torch is the regulating valve knob.

This leak detector reportedly develops 140 lbs. pressure at 1800° F. to 1900° F.

"LOOKS LIKE THEY'RE PUTTING THE BEST PART OF THE SHOW AT BOOTHS 203-205 and 303-305"

AT THE 5TH ALL-INDUSTRY REFRIGERATION AND AIR-CONDITIONING
EXPOSITION
CLEVELAND PUBLIC AUDITORIUM, CLEVELAND, OHIO, JANUARY 26-29, 1948
WE'LL BE LOOKING FOR YOU!
THE EBCO MANUFACTURING CO., COLUMBUS 8, OHIO

RAMSEY-BENNETT CO.
largest midwest distributor for
GENERAL ELECTRIC
cordially invites you to
VISIT OUR SHOWROOM
and see our special offerings in
commercial refrigeration

AIR-ITE . . . the newest . . . fastest . . . most economical beer pump on the market has only three moving parts. Built of die-cast aluminum, its DIATON action, piston type compressor with sealed-in bearing requires no lubrication. Cannot contaminate beer! Connected directly with motor . . . there are no V belts or gears to wear.

AIR-ITE is available for services other than beer pump operation. Wholesale distributors . . . retail dealers wanted. Write for details.

Dealers Wanted

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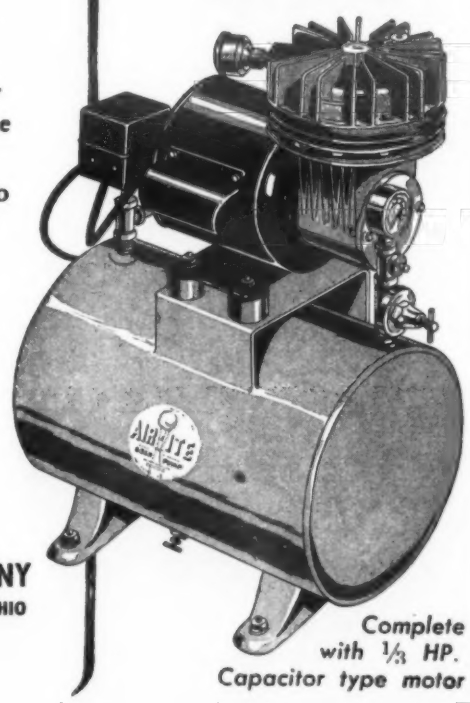
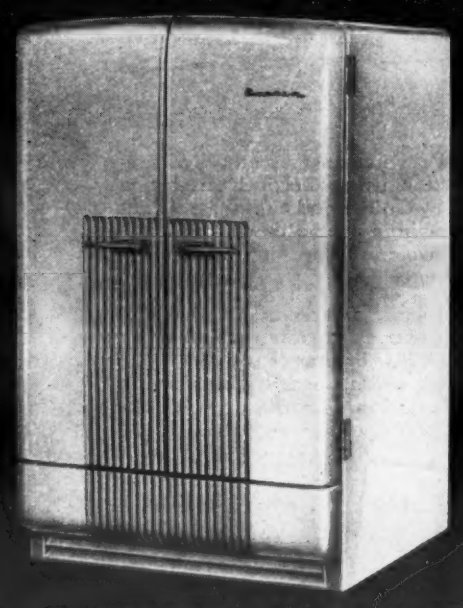
AIR-ITE
The Balanced Pressure Beer Pump



Complete with ⅓ HP. Capacitor type motor

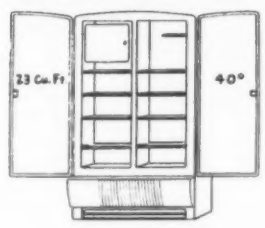
Let's go! Nation Wide
WE ARE READY TO FRANCHISE
ALERT DISTRIBUTORS AND DEALERS
3 Great New Refrigerators

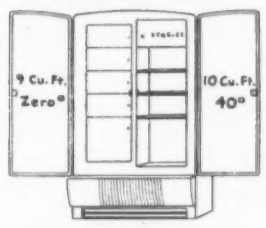
ONE OUTSTANDING DESIGN
IT'S Entirely New
IT'S Streamlined
IT'S Economical

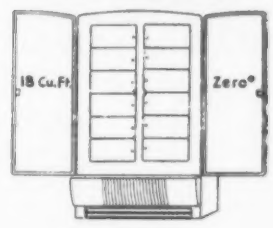


THREE POPULAR MODELS
FOR Domestic
AS WELL AS
Commercial

. . . AND IT'S A MONEY MAKER FOR YOU

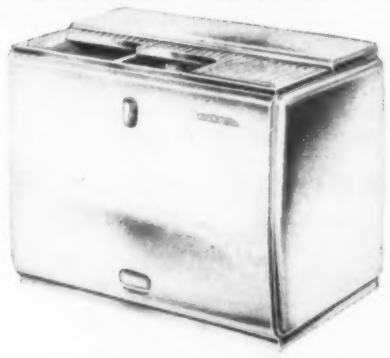
REFRIGERATOR


COMBINATION


ALL FREEZER


. . . PLUS THE Buxtonaire SPEED COOLER

For BEVERAGES and PACKAGED FOODS



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ACRMA Analysis Shows:

Air Conditioning, Commercial Exports Hit $32.6 Million In First 7 Mos. of 1947

WASHINGTON, D. C.—An analysis of Bureau of the Census foreign trade data prepared by the statistical department of the Air Conditioning & Refrigerating Machinery Association under the direction of William B. Henderson, executive vice president, shows that air conditioning and commercial refrigeration equipment shipped abroad during the first seven months of last year had a value of $32,634,906.

This figure represents 1.2% of the total value of all machinery and vehicles exported in that period ($2,699,876,669), according to the analysis.

Of all the types of air conditioning and commercial refrigeration equipment exported, self-contained refrigeration equipment had the largest dollar value, $8,884,392, or 27.2% of the total.

Air conditioning and refrigeration auxiliary equipment was next with a value of $6,161,889, or 18.9%, followed closely by compressors and condensing units with a value of $6,063,346, or 18.6%. Units of ⅛ through 3 hp. accounted for 13.2% of the 18.6%.

The analysis reveals that South America was by far the leading market, taking $8,911,500 worth of equipment, or 27.3%. This was almost twice the amount that went to the two next largest buyers, Europe ($4,994,394 or 15.3%) and Canada ($4,591,322 or 14.1%).

Complete results of ACRMA's analysis are shown in the four accompanying tables.

Table 1 shows total export shipments of all machinery and vehicles, total shipments of air conditioning and commercial refrigeration equipment, and the percentage of the overall total represented by the latter.

Table 2 shows by months the dollar value of each separate classification of equipment. Table 3 shows by product groups the dollar value of shipments by destination and Table 4 shows a percentage breakdown of the figures.

Table 1—Total Export Shipments

	All Commodities*	Air Cond. & Com'l Refrig. Shipments	% of Total
January	$ 342,282,285	$ 2,805,118	0.82
February	355,104,275	3,454,706	0.97
March	403,057,539	4,682,108	1.16
April	414,925,768	5,217,401	1.26
May	463,488,948	6,556,963	1.41
June	357,308,260	5,217,363	1.46
July	363,709,594	4,701,247	1.29
Total	**$2,699,876,669**	**$32,634,906**	**1.2**

*Machinery and vehicles.

YES, a completely new and revolutionary method of fireproof refrigeration construction using Zerocel Insulation has recently been developed by Gold Bond engineers. It not only brings you important savings over old-fashioned methods of low temperature insulation, but it also insures greater efficiency and permanence!

Zerocel installed with metal lath, channels, and Portland cement plaster replaces old-style construction methods using board forms of insulation. This insures stronger walls, ceilings (that won't fall down), and a better looking finish. With this construction, condensation does not occur in the insulation.

- Efficient, "K" factor of 0.24 BTU at 60° F.
- Fireproof
- Will not absorb moisture
- Odorless
- Will not settle
- Immune to fungus, rot and decay
- Vermin-repellent
- Easy to cut with a knife

GOLD BOND ZEROCEL INSULATION

This versatile method, a development of National Gypsum Company's 20 years' experience in the construction industry, applies equally well to locker plant, cold storage warehouse, and processing plant problems. Find out all about this new method today! Fill in the coupon below and mail to Industrial Division, National Gypsum Company, Buffalo 2, N. Y.

SEND FOR FREE BOOKLET TODAY

National Gypsum Company,
Buffalo 2, N. Y.

Gentlemen:

Please send me a FREE copy of the new Gold Bond Zerocel Booklet, "Fireproof Refrigeration Construction." A-1a

Name.....

Company.....

Street.....

City..... State.....

Self-Contained Commercial Refrigeration Equipment Led All Types In Fight for Export Dollar Volume

Table 2—United States Exports of Domestic and Foreign Merchandise Air Conditioning and Commercial Refrigeration

	Jan.	Feb.	March	April	May	June	July	Total	% Total
Compressors & cond. units (com'l)									
⅛ hp. through 3 hp.	$ 263,998	$ 444,675	$ 530,662	$ 658,107	$ 842,283	$ 817,031	$ 747,522	$ 4,304,278	13.2
Over 3 hp. through 10 hp.	79,055	64,852	79,359	62,115	139,520	132,509	128,492	685,902	2.1
Over 10 hp.	47,347	134,399	223,023	111,682	224,024	179,657	153,034	1,073,166	3.3
Total	**390,400**	**643,926**	**833,044**	**831,904**	**1,205,827**	**1,129,197**	**1,029,048**	**6,063,346**	**18.6**
Centrifugal refrigeration units	8,925	573	37,278	45,402	28,911	6,058	13,999	141,146	.4
Absorption & adsorption systems	9,512	35,307	57,217	174,099	27,785	39,625	3,618	347,163	1.1
Evaporative condensers	12,777	10,707	15,184	30,551	40,946	23,906	31,926	165,997	.5
Condensers except evaporative	8,434	31,361	9,659	73,167	45,504	43,486	110,011	321,622	1.0
Heat transfer equipment	48,806	89,245	48,252	50,376	92,075	82,626	79,888	491,268	1.5
Ice making equipment	163,604	179,131	238,753	520,523	301,761	364,278	229,393	1,997,443	6.2
Air diffuser units	27,724	26,770	27,401	44,460	92,478	84,896	45,021	348,750	1.1
Self-contained com'l refrig. equip.	790,697	784,151	1,439,777	1,508,008	1,667,662	1,587,591	1,106,506	8,884,392	27.2
Liquid coolers	13,199	23,494	38,317	18,407	54,555	42,186	249,437	439,595	1.3
Self-contained air cond. (under 2 tons)	96,062	258,191	325,803	229,551	283,711	328,028	255,105	1,776,451	5.4
Self-contained air cond. (2 tons and over)	92,715	134,538	112,674	86,200	226,752	159,726	129,066	941,671	2.9
Mechanical com'l refrigerators	195,081	260,764	264,395	217,394	1,242,128	196,441	175,202	2,551,405	7.8
Air cond. & refrig. aux. equipment	734,844	740,733	882,342	1,136,973	861,033	793,225	1,012,819	6,161,889	18.9
Air cond. & refrig. parts (for foreign assembly)	48,559	59,502	55,836	31,327	65,564	40,205	23,088	324,081	1.0
Air cond. & ref. replacement parts	163,779	176,313	296,176	219,139	320,271	295,889	207,120	1,678,687	5.1
Total	**$2,805,118**	**$3,454,706**	**$4,682,108**	**$5,217,481**	**$6,556,963**	**$5,217,363**	**$4,701,247**	**$32,634,906**	**100.0**

Table 3—Shipments of Air Conditioning and Commercial Refrigeration by Destination January-July, 1947

	Asia	Canada	Mexico	Europe	Central America	South America	Others	Total
Compressors & cond. units (com'l)								
⅛ hp. through 3 hp.	$ 234,707	$ 836,589	$ 258,302	$ 870,409	$ 418,672	$1,212,777	$ 472,822	$ 4,304,278
Over 3 hp. through 10 hp.	96,527	96,670	55,963	99,200	42,993	200,048	94,501	685,902
Over 10 hp.	145,100	164,696	80,584	111,974	53,350	242,837	274,625	1,073,166
Total	**476,334**	**1,097,955**	**394,849**	**1,081,583**	**515,015**	**1,655,662**	**841,948**	**6,063,346**
Centrifugal refrigeration units	10,591	35,610	2,094	3,960	4,993	47,285	36,613	141,146
Absorption and adsorption systems	43,372	35,043	32,277	130,912	41,826	23,184	40,549	347,163
Evaporative condensers	25,361	35,308	29,695	11,797	15,136	35,767	12,933	165,997
Condensers except evaporative	30,201	51,816	7,201	25,900	9,194	182,185	15,125	321,622
Heat transfer equipment	10,320	116,511	55,863	103,416	71,761	52,426	80,971	491,268
Ice making equipment	480,038	206,836	401,052	98,601	287,059	349,489	174,368	1,997,443
Air diffuser units	47,908	71,342	74,599	37,705	14,330	62,846	40,020	348,750
Self-contained com'l refrig. equip.	991,787	948,672	1,078,910	954,860	1,000,983	3,217,539	691,641	8,884,392
Liquid coolers	7,299	72,668	43,866	48,695	18,222	235,584	13,261	439,595
Self-contained air conditioners (under 2 tons)	894,766	50,000	110,653	16,690	200,838	297,019	206,485	1,776,451
Self-contained air conditioners (2 tons and over)	252,571	110,476	212,399	59,508	108,532	153,237	44,948	941,671
Mechanical com'l refrigerators	166,205	182,118	256,977	1,101,641	139,651	566,503	138,310	2,551,405
Air cond. & refrig. aux. equipment	434,557	1,166,507	521,305	995,581	531,589	1,561,532	950,818	6,161,889
Air cond. & refrig. parts (for foreign assembly)	20,258	85,251	40,376	22,941	55,318	67,893	32,044	324,081
Air cond. & ref. replacement parts	155,088	325,209	135,332	300,604	58,014	403,349	301,091	1,678,687
Total	**$4,046,656**	**$4,591,322**	**$3,397,448**	**$4,994,394**	**$3,072,461**	**$8,911,500**	**$3,621,125**	**$32,634,906**

(Concluded on next page)

Notice

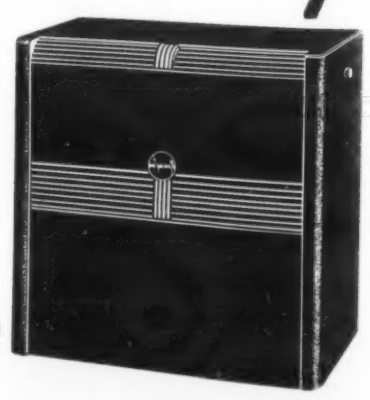
CONCERNING CLEVELAND AND NEW YORK SHOWS

Remington is not exhibiting at either show. But we will have our new Model 10 De Luxe—"the finest room air-conditioner that money can buy"—on private display in both cities.

This is the ALL-YEAR unit that heats as well as cools.

CLEVELAND: Contact Wayne Clemens or Herb Laube at Hotel Olmsted, Telephone MAin 9660. It's just a few steps from Exhibition Hall. You're invited to come in and relax.

NEW YORK: We will both be at the Hotel Commodore. Lexington Avenue at 42d Street, telephone MUrray Hill 6-6000. Better come up and sit down, when your feet get tired.



REMINGTON
Air Conditioning DIVISION
Cortland, New York

WORLD TRADE NEWS

Report on Argentina:

Argentina's Units Can't Match Ours But Refrigerators 'Almost As Good'--Friedman

Editor's Note: This is the seventh in a series of field reports analyzing the Latin American market for refrigeration and air conditioning equipment.

By Harry D. Friedman, American Refrigeration Export Co.

Every major manufacturer of refrigeration equipment is represented in the Argentine by an exclusive distributor or an agent and some by both. Most of the leading refrigeration firms have headquarters in Buenos Aires (a stately city of approximately 2,500,000 people) and have either their own offices, subdistributors, or agents in the other cities.

The other principal cities are Cordoba, Santa Fe, Rosario, and Tucuman. The refrigeration distributors in these cities do very little importing direct from the States, inasmuch as they are all supplied by direct importers in Buenos Aires.

GOVERNMENT RESTRICTIONS

The refrigeration business in Argentina was good at the time of my visit and was expected to remain so. At that time, Argentina had a sufficient amount of dollars and a favorable trade balance. However, import restrictions imposed later in order to conserve remaining dollar reserves were even more strict than these prevailing when I was there.

Almost every commodity which Argentina has to import was under government restrictions. Before placing orders with American suppliers, an importer (at the time of writing) had to apply to the Central Bank for an import license.

The Central Bank is actually controlled by the government. This organization has the power to either grant or deny importers the right to bring merchandise they wish to purchase into the Argentine.

If the license was granted, the dollars were automatically granted for the purchase. The importer then took the license to his own bank and instructed them to open a Letter of Credit, or he arranged to make payment available through some other means, to the respective supplier.

It was stipulated in import licenses that the merchandise the importer had contracted for had to be landed in Argentina by a certain date, or else he was subject to a fine. The amount of the fine was determined by the value of the remaining portion of the order which had not been shipped.

This stipulation was very annoying to importers. They fully realized that when they contracted for specific equipment which American suppliers informed them could be shipped promptly there would be occasions when certain parts of an order could not be shipped because of labor disturbances or other unforeseen occurrences. However, the government was not taking these factors into consideration and was continuing to impose the fines.

The only item in refrigeration equipment which could be imported rather freely at the time was condensing units. Although there are factories in the Argentine that produce condensing units, it is conceded that our units are far superior. The landed cost of our units was not much higher than the cost of theirs.

Display cases, reach-in boxes, and other prefabricated refrigeration equipment, including coils, diffusers, condensers, etc., are not imported to a great extent by Argentine firms. This is because they are manufactured locally, and the government will not issue import licenses for such items unless the equipment is of such a nature that it cannot be made locally or if our equipment is proven to be superior.

Air conditioning equipment, as well as houschold refrigerators, are items for which licenses could not be obtained.

While I was in the Argentine, the government issued an edict prohibiting the importation of motors up to 30 hp. from the United States. During the course of my discussion with people who were connected with the government, I found that the reasons for these restrictions, regarding the importation of certain equipment, were to encourage Argentine manufacturers to fabricate similar equipment, to stimulate the development of new industries, and to increase employment within the country.

The government will also prohibit the importation of a certain commodity in a completely assembled state if it feels that that item can be imported in a disassembled state, so that it may be assembled in a local factory.

Argentina is, of course, known for its wonderful beef and dairy products, and until recently was considered an agricultural country. However, the new government is determined to industrialize Argentina, and from what I have seen I am inclined to believe that they will be somewhat successful.

The standard of living is high. It may be said that Argentina has almost the same standard as we have in the United States, with the exception that their food is considerably cheaper because of the great abundance of meat and dairy products. Because of these principal industries, refrigeration plays an important role in the Argentine.

ENGLAND RESUMES PRODUCTION

Last year, many Argentine refrigeration distributors purchased large quantities of refrigeration equipment from Sweden, especially condensing units in very large sizes, because of the inability of American manufacturers to deliver. Prior to the war, England was also a great source of supply. In fact, many people told me that when England has again resumed the production of equipment such as she produced prior to the war, they will go back to doing business with English firms, as well as Swedish and American firms.

Most of the display cases, reach-in refrigerators, household refrigerators, and similar equipment manufactured locally are almost as good in construction and appearance as our own products.

I visited and was conducted through a large plant manufacturing display cases and reach-in boxes. I was very favorably impressed with the construction of the equipment in this plant, which in some cases was better than ours.

We use impregnated glass wool for insulation purposes, whereas I was told that the Argentine manufacturer would not think of using this product to insulate his equipment. For insulation purposes, they use only cork, which is imported directly from Spain and Portugal.

There was a great building boom in Argentina, and the government had undertaken a five-year plan whereby they are improving their entire transportation system, which was acquired from British interests.

Regarding the political situation, it is true that the present government is a dominant factor in every business undertaking. The businessman, however, does not feel that the government will prohibit him from doing business. In spite of all the restrictions, the businessman still feels that he can and will continue doing business with whomever he pleases, except that it now takes him longer to consummate a deal because he has to go through channels and actually get permission from the government, in the way of licenses, before a deal may be finalized.

Analysis Shows South America Is Leading Market

(Concluded from preceding page)

Table 4—Shipments of Air Conditioning and Commercial Refrigeration
Per Cent Distribution of Shipments by Product Group, by Destination—January-July, 1947

	Asia	Canada	Mexico	Europe	Central America	South America	Others
Total Shipments	**12.4%**	**14.1%**	**10.4%**	**15.3%**	**9.4%**	**27.3%**	**11.1%**
Compressors & cond. units (commercial)							
⅛ hp. through 3 hp.	5.5	19.4	6.0	20.2	9.7	28.2	11.0
Over 3 hp. through 10 hp.	14.1	14.1	8.2	14.4	6.3	29.2	13.7
Over 10 hp.	13.6	15.3	7.5	10.4	5.0	22.6	25.6
Total	**7.9**	**18.1**	**6.5**	**17.8**	**8.5**	**27.3**	**13.9**
Centrifugal refrigeration units	7.5	25.3	1.5	2.8	3.5	33.5	25.9
Absorption and adsorption systems	12.5	10.0	9.4	37.7	12.0	6.7	11.7
Evaporative condensers	15.3	21.3	17.9	7.1	9.1	21.5	7.8
Condensers except evaporative	9.4	16.1	2.2	8.1	2.9	56.6	4.7
Heat transfer equipment	2.1	23.7	11.3	21.1	14.6	10.7	16.5
Ice making equipment	24.0	10.4	20.1	4.9	14.4	17.5	8.7
Air diffuser units	13.7	20.5	21.4	10.8	4.1	18.0	11.5
Self-contained com'l refrig. equipment	11.2	10.7	12.1	10.7	11.3	36.2	7.8
Liquid coolers	1.7	16.5	10.0	11.1	4.1	53.6	3.0
Self-contained air cond. (under 2 tons)	50.5	2.9	5.8	1.0	11.4	16.8	11.6
Self-contained air cond. (2 tons & over)	26.8	11.7	22.6	6.3	11.5	16.3	4.8
Mechanical commercial refrigerators	6.5	7.1	10.1	43.2	5.5	22.2	5.4
Air cond. & refrig. aux. equipment	7.1	18.9	8.5	16.2	8.6	25.3	15.4
Air cond. & refrig. parts (for frn. assmb.)	6.3	26.3	12.5	7.0	17.0	21.0	9.9
Air cond. & refrig. replacement parts	9.2	19.4	8.1	17.9	3.5	24.0	17.9

OIT Reports on Commercial Market In Eire

WASHINGTON, D. C.—The market in Eire for commercial refrigeration equipment is better than for household types, according to the Office of International Trade, Department of Commerce.

"In surmounting the difficulties presented by dollar exchange, commercial-type refrigeration also has an advantage over the domestic type," OIT said. "This type of machinery is distributed by commission agents who also conduct a retail trade."

The agency noted that refrigeration and cold-storage equipment is assembled in Eire chiefly from imported parts. It said that a large portion of this work is done in Dublin.

Gross output was reported as amounting to £36,098 in 1937, £34,650 in 1938, £58,242 in 1939, £41,018 in 1940, £23,304 in 1941, £25,986 in 1942, £26,147 in 1943, and £24,528 in 1944. Imports of apparatus and parts were valued at £10,333 in 1942 (latest data available), compared with £18,306 in 1941, £22,748 in 1940, and £43,840 in 1939.

More VALUE SALES PROFIT
Realizing that 80% of all frozen foods are sold on the spur of the moment, ULTRA-COLD has designed their cabinets to offer the most attractive display of frozen foods possible... the best point-of-sale advertisement for increasing sales. There is no trick to selling ULTRA-COLD Freezers... their modern, sales stimulating features make ULTRA-COLD a must with smart merchants.
30 INDIVIDUAL UNITS TO CHOOSE FROM FOR COMMERCIAL USE
MODEL 112 DBL (illustrated) Display Back Freezer Approximately 12 cu. ft.
Length 64", Width 30", Height 53".
2 Clear 100% Vision Sliding Doors. Display back has full view mirror. Fluorescent lighting, price rack and cards.
Finish: Exterior, No. 4 finish, high polish Stainless steel top with blue-white baked enamel sides.
5" of scientifically approved insulation. Finger-tip thermostatic control. Automatic Expansion valve. Heavy duty commercial type condensing unit. 110-220 volt 50 or 60 cycle single phase. Refrigerant Freon. Adjustable cabinet dividers.
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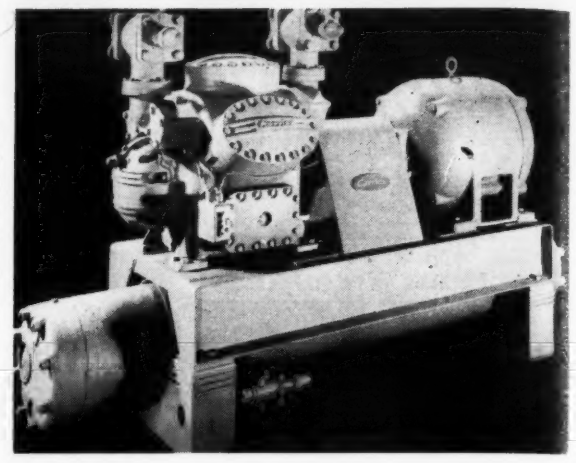
Apple Waste Cut 50% In Refrigerated Cases

YAKIMA, Wash.—Refrigerated retail display cases can cut the waste and spoilage loss on apples by more than one-half, a study conducted by the U. S. Department of Agriculture and reported by the Washington State Apple Commission research department, has revealed.

Average loss was reduced from 4.7% in non-refrigerated displays to 1.9% in refrigerated displays, according to the Commission's recent report.

One of Carrier's 'Customized' Models

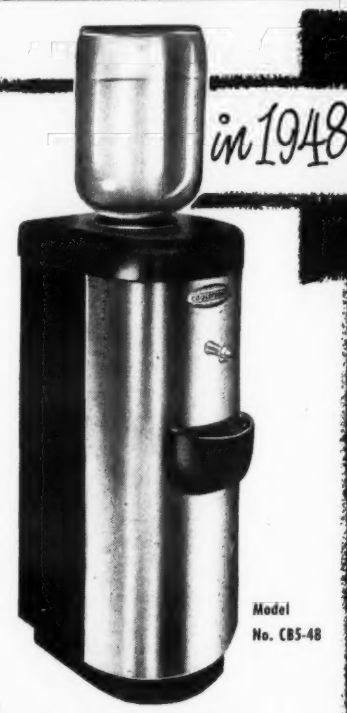


Carrier's 6-cylinder, 40-hp. condensing unit, which is a part of its 1948 'Customized' line. Carrier's new reciprocating compressors range from 5 to 100 hp.

in 1948 coolstream electric water coolers give you all three!

- plus
- unlimited
- color
- combinations!

(Exclusive with Coolstream)



Model No. CB5-48

1. BOTTLE TYPE
Stainless Steel Front Panel
Lucite top with matching side panels, in exclusive color combinations.
Improved mechanism makes servicing simpler.

Model No. CP10-48

2. PRESSURE BUBBLER
Automatic stream regulator
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Lucite top with matching side panels, in exclusive color combinations.

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3. BOTTLE TYPE
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Larger refrigerator capacity, with 2 ice cube trays

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N.Y. Board of Education Installs 10 Reach-Ins

NEW YORK CITY—The board of education here has recently completed the installation of ten 16-cu. ft. stainless steel reach-in refrigerators in some of the school cafterias. Cases manufactured by the General Refrigerators Corp. were used, according to Murray M. Weiser, local sales manager.

Reason given for the installation was the sanitary and healthful effect that the equipment will have on the school children.

Imperial Catalog Includes Wide Range of Parts and Data

CHICAGO—A wide range of refrigeration valves, fittings, driers, filters, floats, charging and testing equipment, tubing tools, and welding and soldering equipment are described in the new 36-page catalog just issued by the Imperial Brass Mfg. Co. here.

Among the technical features of the catalog is a page giving data on the use of charging and testing equipment. There are also pages giving complete dimensional data and other information on Imperial Triple-Seal flared tube fittings.

Detailed data is presented on Dia-Seal valves and Torpedo driers, and there is a convenient selector chart for picking out tube cutters, flaring tools, benders, pinch-off tools, etc.

Compressors May Be Adapted to Installation

SYRACUSE, N. Y.—A completely new line of "customized" reciprocating compressors, ranging from 5 to 100 hp., has just been announced by Carrier Corp.

The new machines, designed for either air conditioning or low temperature duties, operate at higher speeds and are about half the size and weight of their predecessors, according to Carrier officials.

The compressors are so constructed that they can be assembled in more than 1,000 different combinations, making it possible to "custom tailor" each complete unit to fit the exact requirements of each installation.

Most of the new line is in production and full production is scheduled for next month.

A. P. Shanklin, vice president and general sales manager of Carrier Corp., reported that notices from test installations in the field are encouraging the company to think about expanding original production plans.

"These compressors are the product of more than five years of research and development," Shanklin said. "The entire line is so designed that all components—the compressor, the motor, the base, the coupling, and the condenser—can be individually selected to match the specific requirements of the job to be done. The unit can then be assembled easily on the job without special tools.

"Great flexibility is allowed in the selection of motors, and users can select either a coupling for direct drive or a flywheel for V-belt drive."

This so-called "building-block" plan, Shanklin said, makes the equipment not only easier to handle but will involve less rigging and installation expense, especially in cramped spaces or on the upper stories of buildings.

Among the features of the new compressor line are automatic load-free starting, built-in automatic load levelers, external control of capacity, vapor-cushioned valves, removable cylinder sleeves so that both sleeves and pistons can be easily replaced.

Business Improvement Rate Off—Purchasing Agents

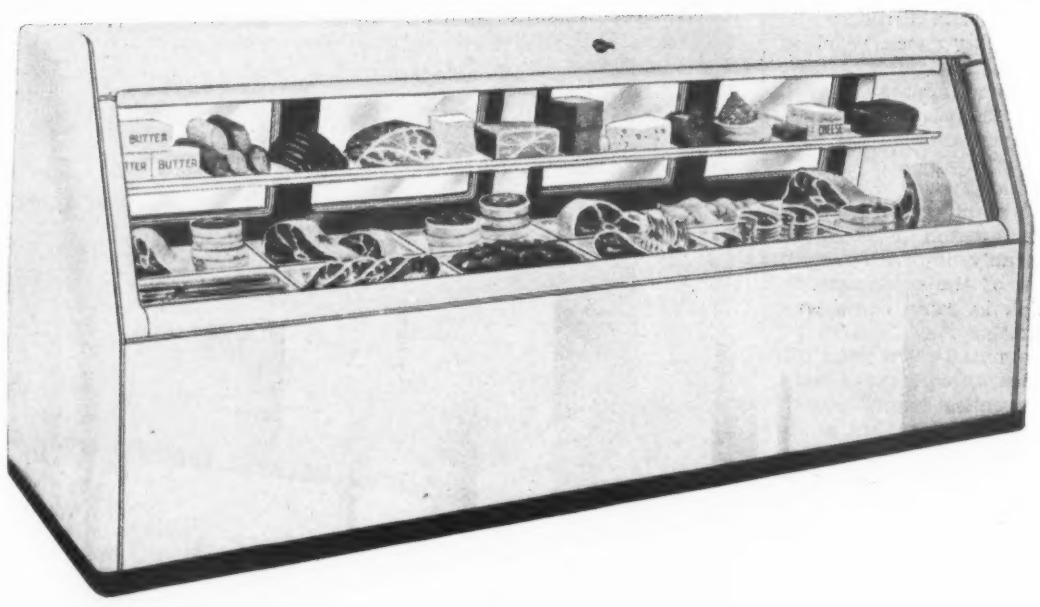
CHICAGO—The high level of business activity now attained probably will continue for the first part of 1948, but the rate of improvement has been declining and now stands at the lowest mark in several months, according to a survey completed at the first of the year by the Purchasing Agents Association of Chicago.

The survey revealed that the number of members reporting deliveries, employment, order backlogs, and general business conditions as unchanged from a month ago had gained at the expense of those reporting on the higher side.

"This slowing down in the rate of increase," said P. C. Patch, chairman of the group's business survey, "may indicate the formation of a high plateau at somewhere near this level. This large volume of business is being transacted with inventories which have been diminishing for a good many months. Now that business may be leveling near the top, the question is how long it can remain there before declines begin to outnumber further advances."

However, most of the purchasing agents don't foresee a recession this year. In March of 1947, over half of the members' replies pointed to a general business recession in 1947. Now, after nine months of very high business activity, only 37% believe 1948 will see a recession.

FOR THE DEALER WHO RESPECTS QUALITY



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Cooperative Plant Management

York-Shipley Experiment In Employe-Management Relations To Use Boards of Office, Factory, Sales, and Distributor Personnel

YORK, Pa. — A forward step in management and employe relations has been taken by York-Shipley, Inc. here, manufacturer of automatic heating equipment—a multiple management program which goes into effect immediately.

S. H. Shipley, president of the company, explained the operation of the program and the reasons for its adoption at a meeting of more than 100 York-Shipley employes and business and industrial leaders of York in the Hotel Yorktowne. York-Shipley employs more than 700 persons in its six York plants.

The York-Shipley program establishes four employe boards of directors to handle management problems and to make recommendations to the senior board of directors of the corporation. These boards will study all types of problems coming to them and will forward their suggestions which meet with unanimous approval to the senior board for immediate action.

The original employe boards were selected by Shipley on the basis of personal merit, but future boards will be selected by employes themselves on a merit rating basis.

The four boards are administrative, representing the office personnel; factory, representing the plant management; sales, representing the sales divisions of the company; and Roosevelt, representing the Roosevelt Oil Service division, York-area distributor for York-Shipley products.

The program is fashioned after the multiple management plan of McCormick & Co., Baltimore, pioneers in the movement. McCormick's plan has been in operation since 1932 and it is credited with being responsible for the program which the Baltimore firm has made in recent years.

"With the expansion which our company has shown in recent years and with the possibiilties which we have ahead of us, this program is vitally important to us," Shipley said. "We want to bring our employes most actively into the management of the company, and those that show strong management qualities will be elected to the senior board of directors.

"We want no 'brass hats' in our company. We need to use all of the talents that we have available. Do not misunderstand that this is a glorified suggestion system. It is nothing of the kind. It is a plan to foster and test thinking in terms of substantial development in the progress of the company and also to develop the personnel responsible for the initiation of progressive ideas."

The obejctives of the program as summarized by Shipley are:

1. To extend an invitation to employes to assist in the management of the company.
2. To give the younger executives an opportunity to qualify for advancement and give recognition of the capacity of younger men.
3. To foster and develop human relations throughout the organization and afford a means of providing maximum benefits to all employes in proportion to their individual contributions to the success of the company.

"Our ultimate objective in multiple management is to manufacture and sell our products in an atmosphere of happy satisfaction, with financial return to both employes and stockholders to the reasonable satisfaction of both, and to develop management personnel from the bottom up solely on a merit system," Shipley said.

The boards will start operating immediately. Initiation of the program will be under the direct supervision of Alan Ross, assistant to Shipley, who has been studying the multiple management setup.

Extra compensation for members of the boards will be voted by the directors of the York-Shipley, Inc., every six months.

Sues, Young & Brown Appoints Wells, Dymek to Key Positions

LOS ANGELES—Appointment of Marshall Wells as general sales manager and Edward J. Dymek as manager in charge of major appliances for Sues, Young & Brown, Inc. here has been announced by M. G. Sues, president of the firm.

The company is a distributor of Coolerator refrigerators and freezers.

Eubanks Heads Airtemp Informational Service

DAYTON, Ohio—Irvin A. "Bus" Eubanks has been named to head the newly created post of supervisor of information at the Airtemp Division of Chrysler Corp., according to an announcement by W. C. Newberg, president of the division.

I. A. Eubanks

Eubanks, a former newspaperman, joined Airtemp in 1946 as editor of Chrysler Airtemp News. The publishing of the dealer and employe magazine will remain under his supervision and in addition he will have charge of all informational activities of the division.

Sawvell Promoted to Harvester Branch Manager at St. Cloud

CHICAGO — Promotion of H. L. Sawvell, assistant product specialist, general lines sales department, International Harvester Co., to the position of manager of the company's St. Cloud, Minn. branch, is announced by A. J. Peterson, manager, general line sales department.

Succeeding Sawvell as assistant product specialist is N. M. Callaham, formerly refrigeration sales representative in the eastern district.

The position of eastern district refrigeration representative will be filled by Larry Beville.

R. C. Stupp, vice president heading production, hands the 1,000,000th Jack & Heintz motor to E. L. Legg, vice president heading sales, as F. R. Kohnstamm (left), general sales manager, H. W. Melampy (center), electric motor division superintendent, and R. J. Ginn, general production superintendent, look on.

* * *

Millionth Jahco Small Motor Rolls Off Assembly, Climaxing 1947 Output Which Was 800% over '46

CLEVELAND—The millionth motor produced by Jack & Heintz Precision Industries, rolled off the company's Berea Road Plant assembly lines early this month, Reber C. Stupp, vice president in charge of production, has announced.

The achievement climaxed a record of persistent production progress which enabled Jack & Heintz in 1947 to exceed its 1946 output of fractional horsepower electric motors by almost 800%. Motor production in 1947 totaled 885,946, against a 1946 aggregate of 102,697.

Jack & Heintz Precision Industries entered the electric motor field in May, 1946, originally producing only special application ⅓-hp. models. Shortly thereafter, it expanded its line to include ⅙, ¼, and ½-hp. motors.

Today, in its Electric Motor Division, the company manufactures 60-cycle split-phase and capacitor-start motors, 50-cycle motors for the export trade, oil-burner motors, washing machine motors, and special application motors, serving industrial customer throughout the world. Every open-type unit has a fractional horsepower motor.

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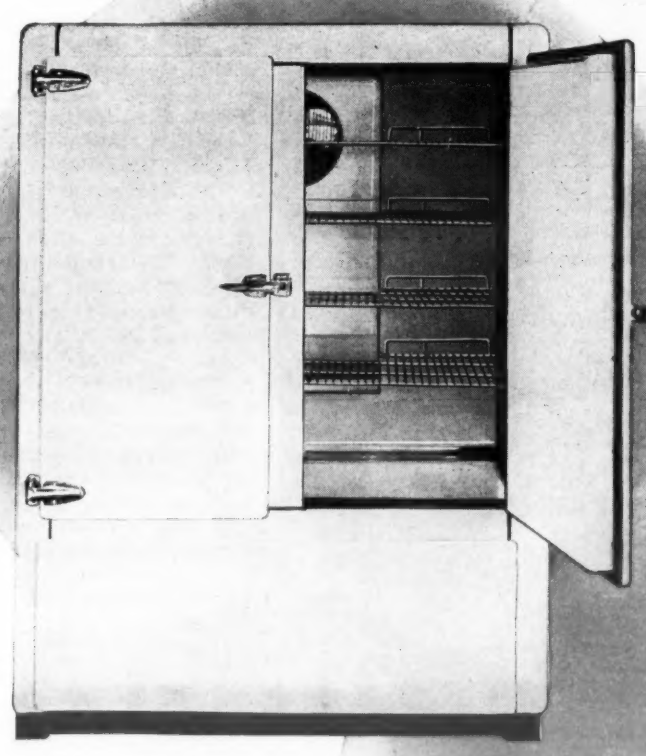

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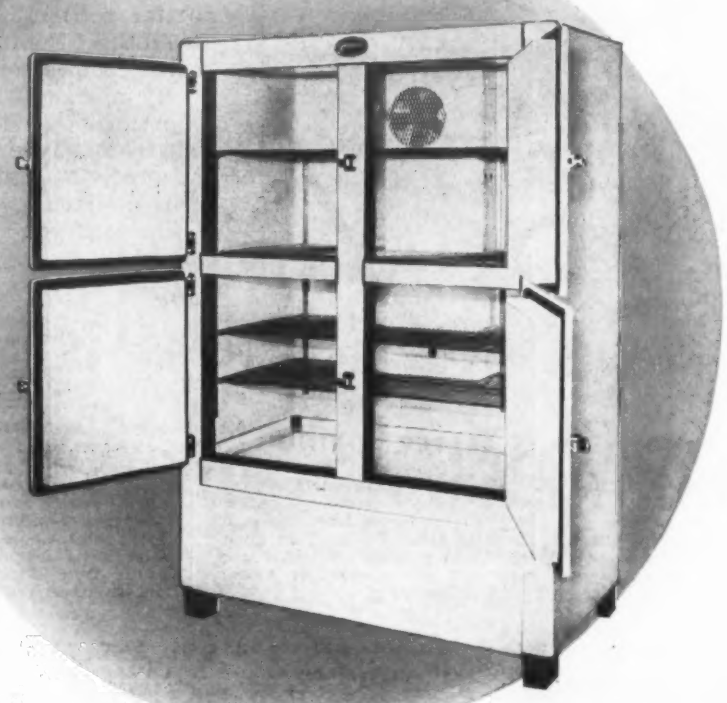
2 Economical Operation
3 Sturdy Construction
4 Attractive Appearance
5 Balanced Refrigeration

Ideal for restaurants, clubs, bakeries, grocery stores, taverns, hotels, fruit and vegetable stores, mess halls, institutions and large homes.

Gloekler refrigerators include: hi-baked DuPont enamel finish, cast chrome plated hardware, electro zinc plated shelving, adjustable shelf standards, narrow width to pass through a standard door opening.



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COMPRESSOR VALVES, ANGLE VALVES, DEHYDRATORS, STRAINERS, FLARE TUBE FITTINGS, SCREW MACHINE PARTS. SILVER SOLDERED ASSEMBLIES. COPPER BRAZED ASSEMBLIES. SPECIAL ASSEMBLY WORK.

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CUPRO NICKEL FINNED TUBES FOR SALE

Immediate Del. From Our Stock Tubes 5/8" OD, 18 ga. (.049"), Navy Spec. 46-9B, in 2 lgths 68" & 86". Mfg. by Revere Copper & Brass. Copper fins, spiral wound, then tinned, fins .020" thick, 1/8" apart, 1 1/8" OD.

Condenser Serv. & Eng. Co., Inc.
95 RIVER ST., HOBOKEN, N. J.

World's Largest Warehouse, Scheduled for Completion In Dallas This Fall, Will Use 1,000 Tons of Refrigeration

DALLAS, Texas — Last Fall the *Daily News* of Dallas under the headline, "Refrigerated Warehouse Plan Expanded to World's Largest," carried the news story that Fred F. Alford, president of Alford Refrigerated Warehouse, had just signed the initial contract for construction of what will be, when it is completed, the world's largest refrigerated warehouse.

Shortly before Christmas, Hy Jarvis, vice president and general manager of Refrigeration Engineering, Inc., Los Angeles, announced that his company had been awarded the contract to supply all of the refrigeration coils for the cold storage warehouse.

At the present time construction is well under way, and the entire project is moving rapidly toward completion. It is expected that construction of the project will be completed late this fall.

Production lines in the "Recold" plant are turning out the first of 285 "Recold" water defrost ceiling type coils, Model number AS-2707-LT which will provide the refrigeration for this mammoth cold storage warehouse. A total of 1,000 tons of refrigeration will be required for the entire job.

A total of 60 acres of ground have been purchased by Alford and the entire group of buildings will occupy approximately 17 acres. The project is comprised of a cold storage warehouse, a dry storage warehouse and an administration building which will house the general offices, an auditorium, and stores.

Aerial view shows that foundations for the 7,500,000-cu. ft. cold storage warehouse and the 8,000,000-cu. ft. dry storage warehouse have already been laid. "Recold" coolers are being used throughout.

The Rock Island Railroad has announced that it will install dual track sidings, each 1,800 ft. in length, along the outboard side of each of the warehouse buildings. This type of installation will accommorate 80 railroad cars at one time and will be the largest of its type in the entire South. In addition to this, Alford will provide 100 ft. of railroad siding along the inboard side of each of the two buildings for greater convenience in loading and unloading.

The entire project will cost $5,250,000 and is being financed with a $3,500,000 loan granted to Alford by the Reconstruction Finance Corp. and the First National Bank. Under the terms of the RFC loan, the funds must be expended within 12 months.

The concrete contract calls for construction of retaining walls around the compacted earth building fills, floors for the warehouse and the street project. The concrete car-level retaining wall around the warehouses will be equivalent in size to a wall 7 ft. high, 18 in. thick, and nearly a mile and a half in length.

A 100-ft. wide concrete street will bisect the two warehouse buildings to provide duplicate facilities for receiving truck shipments. The warehouse floor and street paving project will be equivalent to a 10 mile highway 18 ft. wide.

This unit will be the largest single refrigerated warehouse building in the world, exceeding the present largest, a New York City installation of about 5,500,000 cu. ft.

The refrigerated warehouse will be approximately 1,700 ft. long by 220 ft. wide, plus 15-ft. docks on both sides. This building will be broken up into four separate cold storage vaults which will contain approximately 7,500,000 cu. ft. of storage space.

Typical storage coolers are 200 ft. long by 55 ft. wide. Typical freezers are 200 ft. long by 110 ft. wide.

Temperatures in these freezers will be from -50 to -10° F. Ceiling heights will be 25 ft. with 20 ft. in the clear for palletized operation.

The refrigeration system will originate from an engine and machine room located approximately in the center of the building. Here Ingersol-Rand XVG angle-type gas engine driven compressors will do a gigantic job of providing both high and low temperature storage.

The low temperature storage at -10° F. will be direct expansion, full flooded ammonia; while the high temperature storage at 32° F. will be circulating brine.

All of the low-side equipment will be "Recold" water defrost ceiling type coils. There will be no floor insulation, but the walls and ceiling will have 12 in. of redwood bark. More than 60 carloads of insulation material will be required for the job.

The cold storage warehouse will have a 7,500,000 cu. ft. content. The dry storage warehouse will provide 8,000,000 cu. ft. of storage, calling for air conditioning of all space used for storage. It was originally intended only for dry storage; under revised plans, however, the building will provide a year-round guaranteed temperature to permit safe storage of semi-perishables, such as canned goods, over long periods.

Under this plan, provisions have been made for air conditioning any part of the building down to 65° F. for storage of semi-perishable products.

The administration building will be a two-story structure with two penthouse floors, totaling approximately 50,000 ft. of floor space. The offices will be completely air conditioned with windowless construction.

An auditorium on the second floor will have a seating capacity of 400.

The plant is particularly adapted to palletized handling of carload or large quantity shipments in and out, handling all types of cooler products and frozen foods. Cold storage rooms will have in and out doors operated mechanically to speed up traffic.

Credit for securing the order for "Recold" equipment goes to Lou Snell of Snell Refrigeration Supply Co., of Dallas, "Recold" distributor. The chief engineer for Alford Refrigerated Warehouse is Elliott R. Hallowell who was formerly chief engineer for the Central Engineering Co. of Dallas. He was also a former refrigeration engineer for Frick Co., Inc. It was during Hallowell's association with this company that Lou Snell became acquainted with him and their business friendship has continued down through the years.

As soon as Alford announced his intention of constructing the proposed refrigerated warehouse, Snell became interested in selling as much of the equipment as possible that would go into this gigantic job, particularly the low-side or coil equipment.

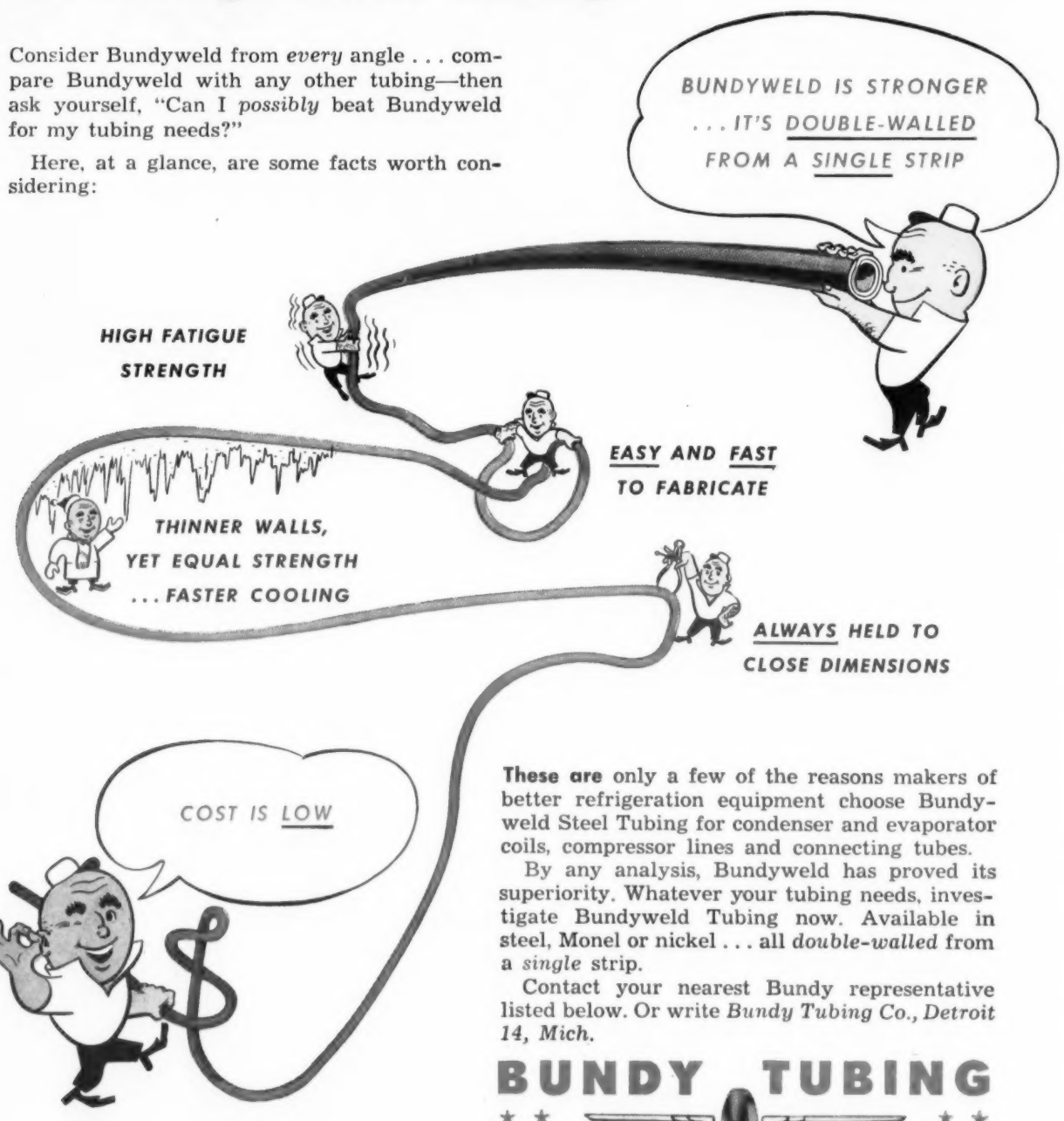
This job is said to be the first really large refrigerated warehouse which will use ceiling type blower coils for refrigeration.

This installation will be identical, with the exception of size, with such jobs as the Haslett Warehouse which was installed in Oakland, Calif. in 1941 and the warehouse of Frozen Food Distributors which was installed in Oakland, early last year.

How can you possibly beat Bundyweld* for refrigeration tubing?

Consider Bundyweld from *every* angle . . . compare Bundyweld with any other tubing—then ask yourself, "Can I *possibly* beat Bundyweld for my tubing needs?"

Here, at a glance, are some facts worth considering: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. . . IT'S DOUBLE-WALLED
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THINNER WALLS, YET EQUAL STRENGTH . . . FASTER COOLING
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These are only a few of the reasons makers of better refrigeration equipment choose Bundyweld Steel Tubing for condenser and evaporator coils, compressor lines and connecting tubes.

By any analysis, Bundyweld has proved its superiority. Whatever your tubing needs, investigate Bundyweld Tubing now. Available in steel, Monel or nickel . . . all *double-walled* from a *single* strip.

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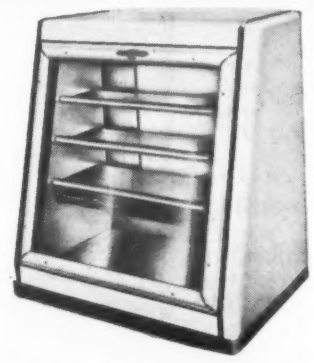

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Industry Focuses Attention on Frozen Food Transportation Losses As Several Developments To Hold Uniform Temperature Continue

NEW YORK CITY — Determination of the extent of damage claims brought against the railroads for losses of frozen foods will be an important step toward focusing industry attention on the problem of inadequately refrigerated railway cars, according to A. E. Huff, manager of transportation and warehousing for Birds Eye-Snider division of General Foods Corp.

Huff, who is also chairman of the transportation and warehousing committee of the National Association of Frozen Food Packers and a member of the steering committee for frozen foods on the research committee of the American Association of Railroads, asserted that the A.A.R. freight claims division will compile separate figures on frozen food losses for the first time when it totals up 1947 claims.

Previously, he explained, these have been included in fresh fruit and vegetable losses. Losses in this category amounted to $12,000,000 in 1946, he said.

Even these losses do not give the complete picture of damage done by inadequate refrigeration, he indicated. There is also the loss suffered from downgrading made necessary by loss of quality due to excessive variations in temperature during the haul.

To correct these conditions and to reduce the cost of transporting frozen foods from processor to consumer, it has been pointed out that adequately refrigerated cars are essential.

Today there are no such cars, but two recent developments indicate that there might be in the not too distant future.

One such development was reported recently by Stanley Grove of Kristalfrost Frozen Foods in Basle, Switzerland. He told an American audience that his firm had satisfactorily tested two railroad cars refrigerated by Diesel driven units using "Freon 12."

A conveyor moves frozen food from zero storage room to waiting pre-cooled Pacific fruit express refrigerator car. To preserve chill of the cartons and block out warm air from the car use of conveyors with canvas covers, which fit tightly to the refrigerator car door, are being planned.

These cars, according to Grove, feature a central compartment that contains two refrigerating units and quarters for an engineer.

Refrigerated compartments in each car have an aggregate 40 tons capacity and can be maintained at different temperatures if desired. Temperatures maintained range upwards from -30° F.

When the cars are placed on a siding, they can be plugged into electrical circuits and the refrigerating units operated by electric motors, he added.

After two months testing in Europe, Kristalfrost ordered seven more such cars from Fiege & Hoff in Rotterdam, The Netherlands, Grove said.

In this country, the U. S. Department of Agriculture early in 1947 conducted successful tests on a railway car refrigerated by a split ammonia system. This car was able to hold a cargo of frozen foods within a range of -4° F. to 3° F. for 10 days—sufficient for a cross-country haul.

Other means of solving the problem of proper transport refrigeration have been reported unsatisfactory. Superinsulated railway cars were produced as an improvement, but even in them, temperatures are said to vary from 15 to 18 degrees in the summer months. There are only 2,000 of these cars—far below the number required to handle the volume of frozen foods now being transported by rail.

Mechanical refrigeration units have proved too delicate to cope with rough usage given railway cars. Dry ice, on the other hand, is too costly for economical shipment of frozen foods.

South Central Idaho, Washington Section Is Scene Of Frozen Food Producing-Processing Boom

TWIN FALLS, Ida.—Between this south central Idaho town and Yakima, in south central Washington, approximately 500 miles to the northwest, lies what is claimed to be the newest, booming frozen foods producing and processing area in the country.

In the years since the end of the war, frozen food processors have been moving in to the area in numbers to take advantage of the rapidly growing supply of fresh fruits and vegetables produced here.

In addition, representatives of the Union Pacific railroad's agricultural department have been promoting the planting of price firm crops to replace those likely to suffer a market drop.

The frozen foods processing and canning plants which have sprung up throughout the whole area are expected to go into full production this year.

At Caldwell, Ida., the J. R. Simplot Industries have constructed facilities for freezing in their canning plant.

At Nampa, Ida., the J. A. Agen Co. managed to process peas, corn, and lima beans last year.

The Eastern Oregon Food Cooperative at Weston, Ore., is ready for full operation this year.

The Bridgeford Co. frozen food and canning plant at Ontario, Ore., is expected to start full operation this year on the freezing of peas, corn, and lima beans.

The same story is told by the Pendleton (Ore.) Canning and Frozen Food Co. which was also in the midst of construction activity last year.

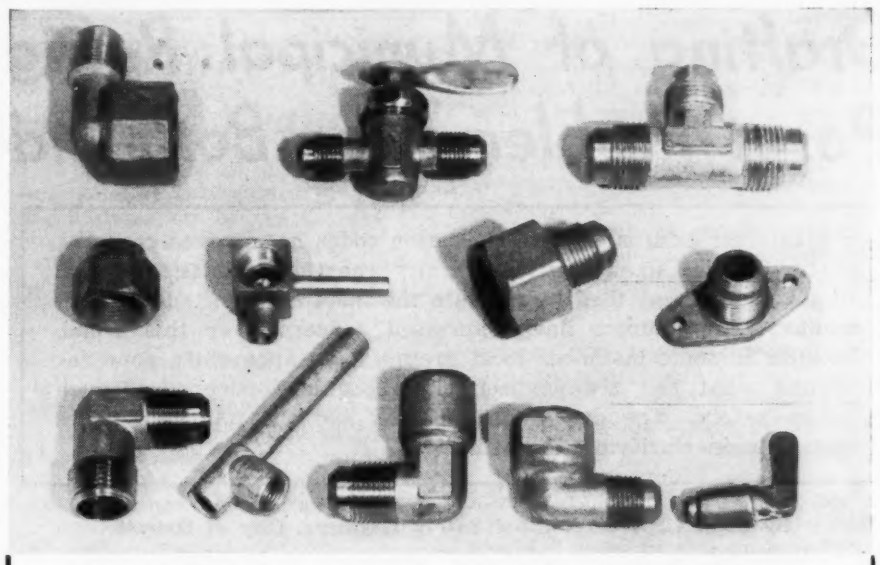
At Milton-Freewater, Ore., the Blue Mountain Prune Growers Cooperative has been processing frozen apple slices in addition to other products.

Across the state line in Walla Walla, Wash., the Birds-Eye-Snider division of General Foods Corp. is reported to be ready to go full blast. It has been gradually increasing its output during the past two years.

The Starr Fruit Products Co. of Yakima, Wash., has recently expanded the portions of its plant used for the preparation of crops to be frozen and its storage rooms.

The Blue Mountain Canning Co.'s new plant at Pomeroy, Wash. is also prepared for full capacity work this year, it is said, after limited production in 1946.

Work has already started at Sunnyside, Wash., on a new freezing plant for the Ecco Packing Co. At Prosser, Wash., C. C. Andrews has constructed a new quick freeze and cold storage plant with plans to add a processing line and quick freeze tunnel with 35 tons daily capacity.



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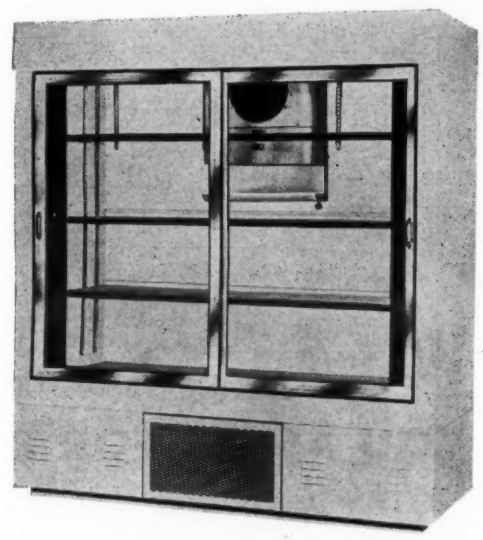

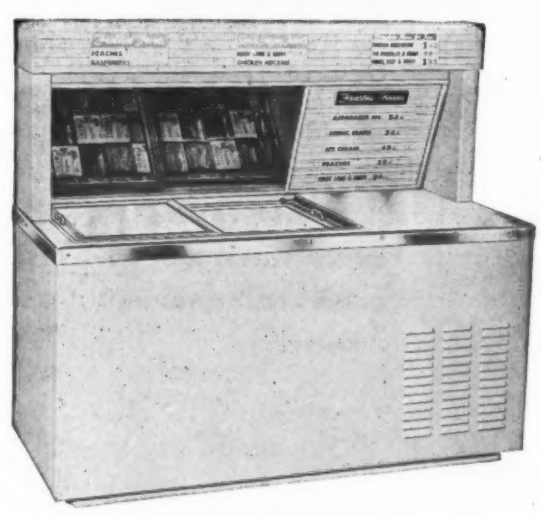

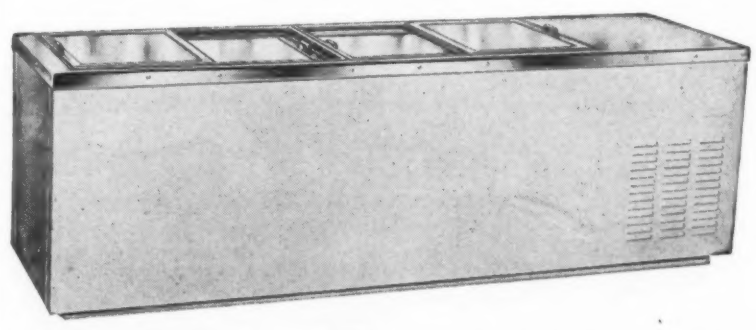

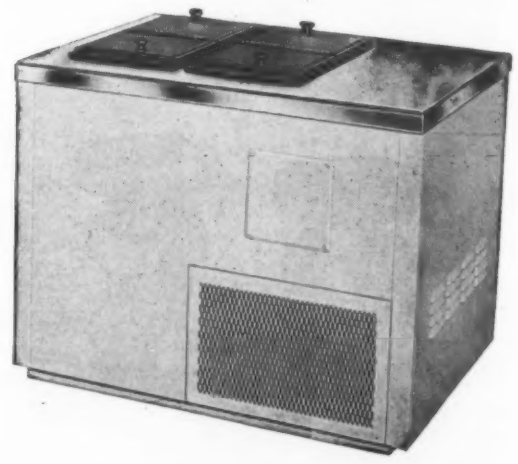

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Drafting of Municipal Refrigeration Codes Poses Problems for Both Industry & Govt.

Interest in municipal refrigeration codes has revived recently, partly because smaller cities are now enacting ordinances which to a varied extent tend to regulate the installation of such equipment. Manufacturers have expressed concern over this trend, because in some instances local groups have apparently gone far beyond what has always been the recognized purpose of such codes—safety. The discussions on this and the following pages may help in clarifying the situation.

By John C. Rehard, Chief Safety Engineer, City of Detroit

Requirements to be covered in municipal codes and the codes themselves have been discussed by agencies and individuals to a far greater extent recently than even in the past. This is a healthy condition for a number of reasons, but mainly because it has caused poeple who are qualified to write them to become interested in the regulations rather than those who have "an axe to grind."

The complexities of our civilization in large cities and, to a somewhat lesser extent, in smaller communities have made regulations governing buildings, boilers, pressure vessels, and many other items mandatory for the best interests in the protection of life and property.

It is only reasonable to expect that with the passage of time more and more such regulations will be found necessary, since there is a definite trend toward mechanisms and devices for general use which can be hazardous in one way or another, especially if they are not completely understood.

Where the danger or possible danger of such as an open fire are quite obvious to most anyone, the hazards of many pieces of equipment are well concealed except to those trained to understand their functions and operations. People in general cannot be expected to recognize the possible faults in construction or the elements of potential safety hazards in buildings and equipment any more than they might all be expected to be engineers.

To carry the same thought still further, it is not at all uncommon for an engineer following one of the several branches of the profession to be totally unfamiliar with the hazards encountered in another field.

Therefore, the first consideration in the drafting of a municipal code must be the selection of a group of competent men capable of understanding the various phases of the problem to be studied. One satisfactory solution of this step has been found to be that of enlisting the aid of the local engineering society.

Because of the fact that a group of engineers selected to study the facts and figures pertinent to a proposed ordinance may be and generally are not too well informed on the legal aspects and enforcement procedures involved, it is expedient to include a member of the local engineering enforcement group on such a committee.

SELECTION OF ENGINEERS

While on this topic, it may be well to include a note of warning concerning the selection of engineers specializing only in the line of endeavor to which a new code is to apply. By "engineering society" is meant a local group comprised of men from a number of different engineering fields and not the local chapter of one of the national societies in a specific field.

There is by no means any intention to discount the excellent work of specialized national organizations in the establishment of national standards and model codes, but experience has demonstrated that for the drafting of local codes a group of men selected from the field directly concerned and from all the related fields is more satisfactory. Viewpoints and aspects of the problems involved are uncovered by this procedure that may be otherwise overlooked.

The adoption of a municipal code often depends upon the favorable action of a politically chosen body and such people generally respect the product of the labors of a reputable and respected group of engineers affiliated with a well known society far more than those groups chosen at random.

POLITICAL PHASES OF CODES

Reasons for such respect are numerous since the political phases of an issue which requires the passage of a code seldom take into account the engineering requirements concerned. Because legislators are rarely technically minded and may not be able to thoroughly understand all the phases of the requirements involved, they are often anxious to have a duly respected organization to rely upon.

However, for the community not so fortunate as to have the more cosmopolitan type of engineering group, there are still tried and proven means of drawing up fair and satisfactory regulations. The selection of fair and unbiased engineering members of the industries involved and engineering representatives of the installers and users of the particular equipment concerned and/or engineers fully acquainted with the problems to form a drafting committee is one satisfactory method.

In any case the drafting committee must be small and the official making the appointments to such a group should exercise the utmost care in his selections to obtain persons who are unbiased and who can be relied upon to regard safety as the primary issue.

The second step in the development of an ordinance is the actual writing of a preliminary draft. Simplicity and clarity are of utmost importance along with fairness and legality. Those governed by the regulations may not fully understand all the reasons for the requirements which they may be obliged to put into practice.

Confusing language and elaborate legal or engineering terms serve only to befuddle the public and provide ammunition for sharp lawyers. Subjects should be dealt with briefly and in only such detail as is necessary in the best interests of safety. The form in which a code is presented can in itself be very confusing to the average citizen.

Chief objection to some of our standard codes and model ordinances are not only their forms but the lack of uniformity among them. Some communities are seeking to correct the latter by attempting to draft all of their own municipal codes along the same general lines as to form.

Under this scheme a code consists of several articles, each dealing with a specific subject or related group of subjects. The first article may deal with the definitions of terms to be used in the ordinances and each definition would be assigned a separate section number for the purpose of clarity.

Next might be Article Two dealing with items of administration with sections covering scope, licensing, permits, fees, inspections, reports, records, powers, and the like. While it is well to include every conceivable definition that might add to the clarity of the code under Article One, just the converse is true concerning some of the points of administration in Article Two.

NOT FUND-RAISING MEDIUM

For instance, the ability to actually administer the ordinance is the prime consideration and any unnecessary licenses, permits, or fees should be disregarded in the writing of the ordinance. A municipal code is designed in the interest of the safety and welfare of the public, and it should not be used as a fund raising medium beyond raising such monies as are necessary to properly implement its enforcement.

Next should follow articles dealing with the various phases of construction, installation, and operation requirements in the order of their importance. Again each article should be broken down into sections, each dealing with a specific item. These in turn may be further clarified by separation into paragraphs and subparagraphs with appropriate numbers and letters.

The sections in each article should be so numbered that they could not be mistaken for sections in another article. A final article covering penalties, a saving clause, and such other details as seem necessary should complete the code.

Even though our national standard codes may not suit local requirements as to form they must not be disregarded. The committees who

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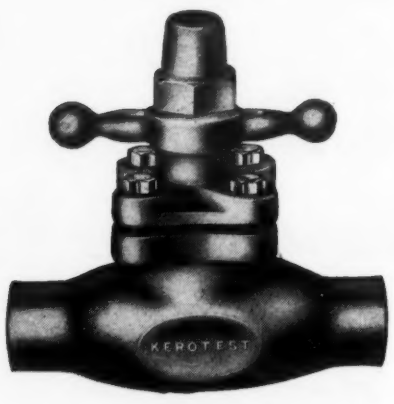

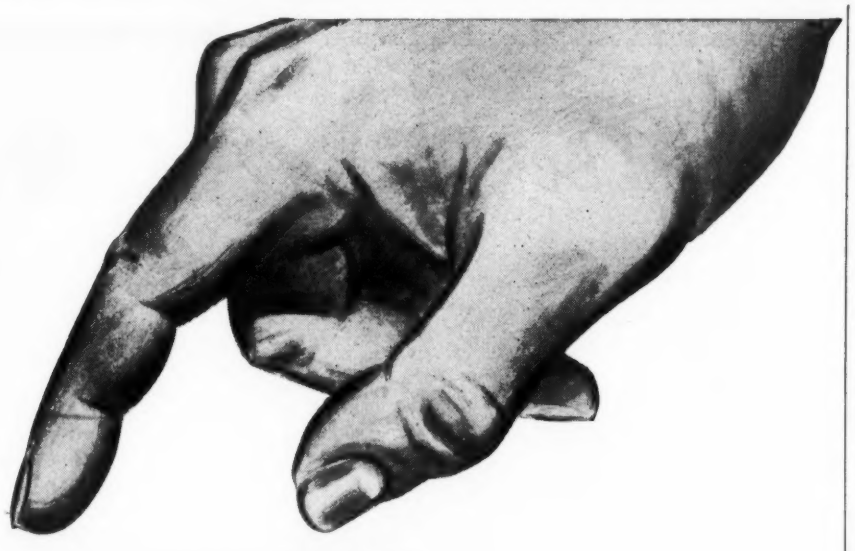

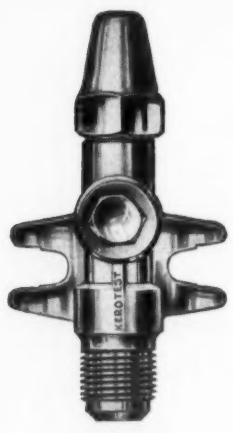

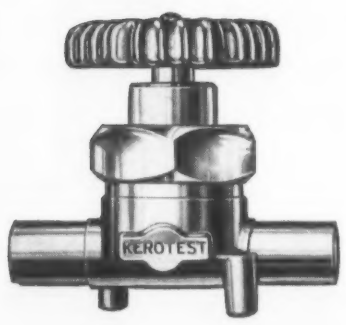

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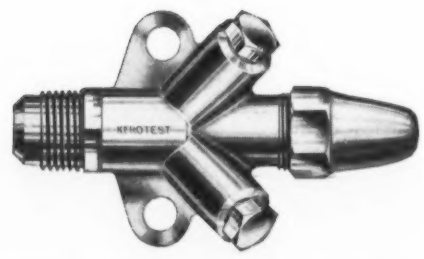

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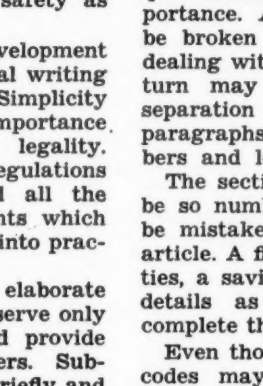

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How Municipal Codes Should Be Drafted

(Concluded from preceding page)

have worked and spent time in assembling the necessary data and facts represent investments that few cities can afford. The subjects covered have been studied on a national scale in the interest of standardization of requirements in such manner as to command respect.

No community can afford to discount the efforts of competent men conscientiously working for the best possible regulation of some particular kind of equipment on a national scale. Standardization of requirements is very important, especially from the manufacturer's viewpoint, and the community which sees fit to set up stringent requirements which are radically different from recognized national standards had better be well prepared to defend its reasons for so doing.

ADAPTING NATIONAL CODES

Generally, the fundamental requirements in the nationally accepted standard codes and model ordinances can be transplanted into the local codes without change, and the alterations in sequence or wording necessary to bring about a sought for form need not spoil the standardization plan.

The third item in the sequence of events, leading ultimately to the adoption of a proposed ordinance, consists of the appointment of a general committee to study the new code. Such a committee should be appointed by the local governing body or official or by the official in charge of the enforcement of kindred regulations.

It should consist of representatives, engineering and otherwise, of all those who may be involved in the application of the proposed code. Like the drafting committee, this group should be as small as possible since large numbers make agreement difficult. It will probably be considerably larger than the drafting committee, however, due to the fact that the latter is composed only of engineers who understand the subject while the former must necessarily include representatives of all those to be affected by the proposed ordinance.

In this committee all of the requirements should be carefully read and studied, and if changes can be agreed upon they should be made. However, if factional tendencies appear concerning certain items, it is often well to delay final settlement of the disputed issue until the next step in the procedure.

The fourth step involves the presentation and study of the proposed regulations by the local governing body. If, by good fortune, the general committee has finished its work by being in complete agreement on all the articles of the new ordinance, the presentation to the council or other assembly should be fairly simple.

Should there have been controversial points that are yet to be settled, the common procedure is to hold public hearings before the governing body with each side of the case being given by its proponents. At this juncture it is always well for the engineers who originally drafted the proposed code to have their engineering reasons reduced to layman language so that they can adequately defend their reasoning.

Some compromise agreements may be in order if the essential purpose can still be served, but deviation from well founded fact solely for the purpose of satisfying a strong political group cannot be tolerated. Consequently, it may become necessary to withdraw a proposed code completely rather than to jeopardize the public with unfair or unsound requirements.

Such a procedure has been followed on occasion, especially when the proponents of the proposed ordinance were convinced that present regulations or no regulations at all would serve the public interest better than the politically distorted version of the new instrument. However, unless the proposed code is of a very highly controversial nature, its passage should not be too difficult if it is well prepared.

Aside from the basic steps in the inauguration of a municipal code is the consideration of the material to be contained in the ordinance.

Fortunately, by a more or less cut and try procedure most cities have developed the administrative and penalty provisions of their ordinances in general so that they can be used as models for new ones. It may be possible to obtain similar regulations from municipalities that already have them in effect, and these may be used as guides in drafting the proposed code.

However, the requirements of the community for which the code is to be drafted may be somewhat dissimilar to those of the others, and wholesale acceptance of codes or a code from another locality seldom can be condoned. They should ordinarily be used only for their value as guides or models. For the engineering provisions, the various national codes and model ordinances are heartily recommended if they apply, but codes drawn up by other than bona fide engineering societies or agencies should be carefully scrutinized before accepting any of their provisions.

Local conditions should be used to determine whether a requirement is suitable for acceptance or if it can be modified to make it more or less stringent, and then used. Codes that tend to lead toward standardization in a given field and for this reason are widely accepted by other states and localities should be incorporated in local ordinances where possible.

In some instances where present laws permit, it may be possible to adopt whole sections of nationally accepted codes by reference and then add only such provisions as are necessary for local enforcement. The idea of first importance is to include only such items as are absolutely necessary in the interest of safety. Where those items come from is relatively unimportant as long as they involve only proven fact and necessity.

Briefly then, the drafting of a municipal code and its adoption need no longer be the hodge-podge guesswork of incompetent persons if a few simple steps and a lot of common sense are used. The (1) selection of a small competent committee to (2) draft a reasonable ordinance for (3) study by a general committee and finally (4) presentation to the governing body has proven to be a very satisfactory procedure.

It is not new nor is it untried. The same general plan has been used on a national scale, and when used locally, generally results in a substantial saving in time.

City Fathers Blush When They're Told Code They've Enacted Is 12 Years Old

FERNDALE, Mich.—Alertness of a refrigeration contractor here has prevented the city commission of this Detroit suburb of 30,000 population from putting into effect a refrigeration code that was 12 years old.

It also resulted in some not-so-good-natured kidding of the city commission and other officials by local newspapers when the story was brought to light.

Actually, the city commission had passed a refrigeration ordinance modeled along that of neighboring Detroit. But the city attorney, unfortunately, had based the Ferndale code on Detroit's ordinance of 1916, which had been amended in 1935. It seems he was unaware that after several years of diligent work Detroit had enacted a new code in the fall of 1945.

No public hearings were held, and it was not until the code had been approved that James E. Perry, local contractor who has also been president of the Refrigeration Contractors Association of Detroit, heard of it.

Perry immediately got in touch with the mayor and other city officials, pointing out that the ordinance was in part "outdated since 1937, made no reference to air conditioning, and omitted the most common refrigerants.

"There's more to drawing up an ordinance of this nature than copying sections of the old City of Detroit code," he explained.

What happened next was described by one local newspaper with the following:

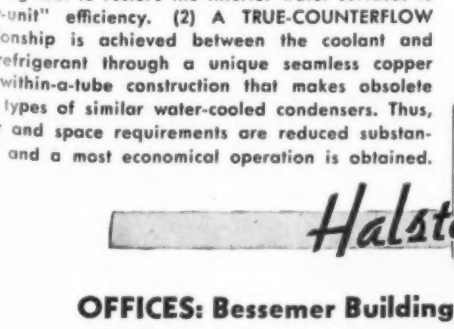
"The Ferndale City commission, its collective face a bright red, Monday night retracted a lengthy and involved refrigeration ordinance adopted at its last session. The ordinance, it appeared, was outdated, outmoded, contradictory, and antiquated."

Said another paper in an editorial:

"A refrigeration code, antiquated or modern, is surely a highly technical writing. By their own admission, the commissioners had not the knowledge to judge the technicalities of this ordinance. Why, then, did they not seek technical advice? . . .

"That it cost the taxpayers approximately $80 to publish the now repealed ordinance is a regrettable but minor matter compared to the serious implications of this ill-considered action. It will probably be well worth the money spent if a future procedure is worked out to avoid the passage of laws which are not for the good of the city."

Contractor Perry reports that the city has started from scratch again and hopes to work out a code—with the assistance of refrigeration men.



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New Refrigeration Code of Los Angeles Differs In Some Respects from Standard

Appearing on this and the following page are excerpts from the new code covering refrigeration and air conditioning installations which has just been enacted by the city of Los Angeles. With the increasing interest shown in such municipal regulations, these excerpts will prove of interest to refrigeration men and city officials in all parts of the country.

Section 95.4100. Permits Required.

(a) Before commencing the installation, alteration, replacement or repair of any refrigeration system or equipment regulated by this code, a permit in writing authorizing such work shall be obtained from the department. A separate permit shall be obtained for the equipment in each separate building or structure.

Exceptions.

1. No permit shall be required for a unit refrigerator.
2. No permit shall be required for any unit refrigerating system containing less than 15 lbs. of refrigerant.

(b) For the purpose of this section, the words "alteration" and "replacement" shall be deemed to include:

1. Moving or relocating in the same building and refrigerant-containing part or parts of a refrigerating system.
2. Changing the class of refrigerant in any refrigerating system.
3. The alteration or replacement of any refrigerant-containing part or parts of a refrigerating system, where the total value of such alteration or replacement exceeds $100 for labor and material.

Exception.

This subsection shall not include normal repair or maintenance operations to a refrigerating system or replacement of moving parts of a refrigerant compressor or evaporator.

Table No. 41-A—Permit Fees.

1. $1 for issuing each permit, plus
2. $1 for each 100 lbs. of refrigerant, or fraction thereof, in excess of the first 50 lbs. of refrigerant, plus,
3. $1 for each refrigerant compressor, plus,
4. $0.50 for the alteration or replacement of any portion of a refrigerating system as specified in Section 95.4100 of this code.

Exceptions.

1. The permit fee for any unit refrigerating system shall be $1 for issuing each such permit plus 50 cents for each unit refrigerating system in addition to the first such system installed in any building.
2. A supplementary permit may be issued upon payment of a fee which shall be the difference between the fee paid for the original permit included the entire installation, alteration or replacement, provided such supplementary permit is obtained prior to the date of final inspection and approval by the department of the installation, alteration or replacement work authorized by the original permit.

(b) **Double fees.** Whenever any person shall commence the installation, alteration, replacement or repair of any refrigerating system, or portion thereof, in violation of Section 95.4100 of this part, such person shall be subject to payment of double the fees as specified in subsection (a) of this section for such permit. The payment of such double fees shall not exempt such person from compliance with any other requirement of this code nor from any other penalty provided for a violation thereof.

Location of Refrigerating Equipment.
Section 95.4600. General.

(a) Every refrigerating system shall comply with the requirements of this part.

(b) An unobstructed opening and passageway not less than 24 in. in the least dimension shall be provided to every refrigerant compressor which is located outside a machinery room complying with the provisions of Part 47 of this code.

(c) No refrigerant compressor shall be located in any hazardous location as defined in Division 54 of the Los Angeles Electrical Code.

(d) No refrigerant compressor or container which is a portion of any refrigerating system shall be located in any surgical operating room.

(e) No refrigerant container or piping shall be located in any elevator or dumbwaiter shaft.

(f) Every room or space, other than a machinery room complying with the requirements of Part 47 of this code, in which a refrigerant compressor is located, shall have an air opening or openings not less than 2 sq. ft. in area to the outside of the building, or shall be provided with a mechanical exhaust system of ventilation arranged to provide a complete change of air in such room at least every 20 minutes and discharge to the outer air.

Exception.

This subsection shall not apply to any room or space, the cubical contents of which exceed that specified in Table 46-A for the type and amount of refrigerant in such system.

(g) No refrigerant compressor which is a portion of any refrigerating system containing ethyl chloride, methyl chloride, or methyl formate shall be located in any room or space in which there is an open flame, spark producing device, or hot surface in excess of 800° F.

Exceptions.

This subsection shall not apply to:

(1) Any room or space, the cubical contents of which exceed that specified in Table 46-A for the type and amount of such refrigerant in the system, or

(2) Any room or space having permanent ventilating openings equivalent to not less than one-tenth the floor area of such room or space, and opening directly to the outside of the building. The lowest portion of at least one-half of such required ventilating opening, or openings, shall extend to within six inches of the lowest floor level of such room or space.

(h) Every refrigerant compressor and container which is a portion of the high pressure side of every refrigerating system containing more than 100 lbs. of refrigerant shall be located in a machinery room complying with the requirements of Part 47 of this code.

Exceptions.

The requirements of this subsection shall not apply to:

(1) Any refrigerant container or compressor located outside of any building or on the roof of any building and not less than 20 ft. away from any door, window or ventilating air inlet in any building.

(2) Any building used exclusively for ice making or cold storage, together with the usual office, storage room, shipping rooms and accessory rooms in connection therewith.

(i) No refrigerant evaporator shall be installed in any air duct so arranged that the same air is first forced to pass through any such evaporator before entering a direct fired warm air furnace, which is not in operation.

Exception.

This provision shall not apply to any warm air furnace, the element of which is constructed of approved non-corrosive material.

Refrigerant Piping, Containers and Valves
Section 95.4800. Piping—General.

(a) All materials used in the construction and installation of refrigerating systems shall be suitable for the refrigerant in such system, and no material or equipment shall be installed which will deteriorate due to the chemical action of the refrigerant or the oil, or combination of both.

(b) All refrigerant piping shall be iron, steel, copper or brass pipe or copper tubing conforming with the requirements of this section.

(c) **Fittings.** All fittings for refrigerant piping shall be of iron or steel or brass or copper and shall comply with the requirements of this code. All valves, flanges and fittings shall be of a type, construction and material suitable for the particular refrigerant contained in the refrigerating system of which such equipment is a part.

(d) All iron and steel refrigerant piping which is a portion of any refrigerating system shall comply with the requirements of this subsection.

All such piping shall comply with the American Standard for Wrought Iron and Wrought Steel Pipe, as approved by the American Standards Association in April, 1939, and known as document A.S.A.-B36-10-1939.

Piping subject to a working pressure in excess of 250 p.s.i. shall have a minimum wall thickness of not less than that specified in Schedule 80 of Table 2 of such American Standard.

Piping subject to a working pressure of not more than 250 p.s.i. shall have a minimum wall thickness of not less than that specified in Schedule 40 of Table 2 of such American Standard. Pipe more than two inches iron pipe size shall be lap-welded or seamless pipe.

Exception.

Piping, 1½ in. iron pipe size and smaller and containing liquid refrigerant, shall have a minimum wall thickness of not less than that specified in Schedule 80 of Table 2 of such American Standard.

(e) **Brass Pipe.** Brass pipe shall conform to A.S.T.M. Specification B 43-42. Brass piping installed in any location where subject to a working pressure in excess of 250 p.s.i shall conform to such specification for extra strong pipe.

(f) **Copper Piping.** Copper pipe shall conform to A.S.T.M. Specification B 42-41T. Copper piping installed in any location where subject to a working pressure in excess of 250 p.s.i. shall conform to such specifications for extra strong pipe.

(g) Copper tubing used for refrigerant piping, and erected on the premises in which the refrigerating system is installed, shall conform to A.S.T.M. Specification B-88-41, grades K or L dimensions, and shall be free from scale and dirt.

Soft annealed copper tubing regulated by this subsection shall not be larger than ¾ in. nominal size.

Section 95.4801. Enclosure for Copper Tubing.

Copper tubing conveying any refrigerant shall be enclosed in iron or steel piping and fittings or in approved conduit, molding or raceway which will properly protect such tubing against mechanical injury from an exterior source.

Every connection and branch fitting in any such tubing shall be enclosed in a junction box placed in a readily accessible location.

Exceptions.

The requirements of this subsection shall not apply to:

1. Copper tubing or piping entirely within the refrigerator.
2. Copper tubing or piping enclosed in insulation not less than 1½ in. in wall thickness.
3. Copper tubing or piping within 5 ft. of a refrigerant compressor so located that it is not subject to external injury.
4. Hard drawn copper tubing installed in locations where not subject to injury from an external source.

Section 95.4802. Erection of Refrigerant Piping.

(a) No refrigerant piping or tubing shall be installed in any elevator shaft, dumbwaiter shaft or shaft having moving objects therein.

(b) Piping and tubing shall be so installed as to prevent excessive vibration and strains at joints and connections.

(c) All piping and tubing shall be securely fastened to a permanent support within 6 ft. following the first bend in such tubing from the compressor, and within 2 ft. of every other bend or angle. In every case, piping and tubing shall be supported at points not more than 15 ft. apart.

(d) Refrigerant piping crossing an open passageway in any building shall not be less than 7½ ft. above the floor unless against the ceiling of such space.

(e) Refrigerant piping shall not be located in a public hallway, lobby or stairway of any building.

Exceptions.

This subsection shall not apply to:

1. Refrigerant piping installed in a tight flue or rigid metal conduit vented to the outer air.
2. Refrigerant piping without joints therein, other than non-ferrous tubing of 1 in. nominal outside diameter or less.
3. Non-ferrous metal tubing of 1 in. nominal outside diameter or less, which is enclosed in a rigid metal conduit with no opening into any such hallway, lobby or stairway.

(f) All such iron or steel piping placed underground shall be coated with asphalt paint.

(g) Iron or steel pipe joints may be screwed, flanged or welded. Screw joints shall conform to American Standards Association Pipe Thread Standard No. B 2-1919. Exposed threads shall be tinned or otherwise coated to inhibit corrosion.

(h) Welds shall conform to the Welding

(Concluded on next page)

Table No. 46-A

Refrigerant	Chemical Formula	Maximum Quantity of of Refrigerant in Lbs. Per 1,000 Cu. Ft. of Room Space
Ammonia	NH_3	2.5
Dichlorethylene	$C_2H_2Cl_2$	5
Ethyl chloride	C_2H_5Cl	6
Methyl chloride	CH_3Cl	3
Methyl formate	$CHOOCH_3$	3
Sulphur dioxide	SO_2	1
Carbon dioxide	CO_2	12
Dichloromethane (Carrene-1)	CH_2Cl_2	6
Trichloromonofluoromethane ("Freon-11")	CCl_3F	35
Dichlorodifluoromethane ("Freon-12")	CCl_2F_2	30
Dichloromonofluoromethane ("Freon-21")	$CHCl_2F$	13
Monochlorodifluoromethane ("Freon-22")	$CHClF_2$	35
Trichloroethylene	C_2HCl_3	35
Tricholorotrifluoroethane ("Freon-113")	$C_2Cl_3F_3$	40
Dichlorotetrafluoroethane ("Freon-114")	$C_2Cl_2F_4$	40

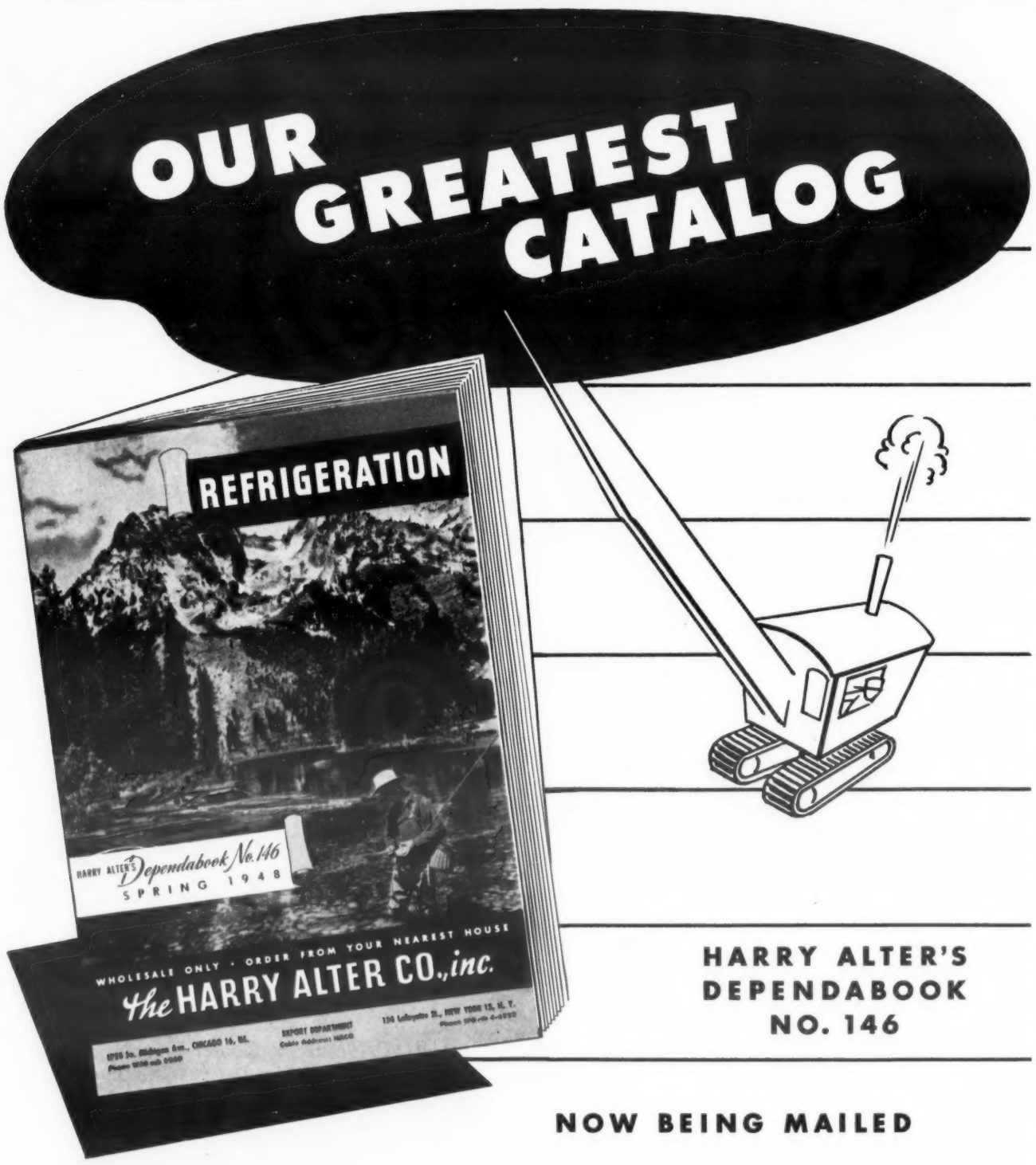
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Table No. 49-A

Refrigerant	Compressor Pressure Limiting Device Operating Pressure Pounds per Sq. In.	Pressure Relief Valves and Devices Operating Pressure Lbs. per Sq. In. High Pressure Side	Low Pressure Side
Ammonia	225	250	150
Carbon dioxide	1200	1350	1000
Dichloroethylene	5	10	10
Dichloromethane (Carrene No. 1)	25	30	30
Ethyl chloride	50	55	50
Trichloroethylene	25	30	30
Trichloromonofluoromethane ("Freon-11")	25	30	30
Dichlorodifluoromethane ("Freon-12")	160	225	125
Dichloromonofluoromethane ("Freon-21")	60	70	50
Monochlorodifluoromethane ("Freon-22")	245	300	245
Trichlorotrifluoroethane ("Freon-113")	25	30	30
Dichlorotetrafluoroethane ("Freon-114")	45	50	50
Methyl chloride	170	200	125
Methyl formate	25	30	30
Sulphur dioxide	125	150	95

Los Angeles Code--

(Concluded from preceding page)

Section of the American Standards Association Code for Pressure Piping B31-1935.

(i) Copper or brass pipe or iron pipe size may be screwed, flanged or brazed.

(j) Every tubing joint and connection shall be approved flared, lapped or swaged brazed joint.

Exception.

Soldered joints may be used to connect any valve to adjoining piping in any refrigerating system containing any Class 1 refrigerant other than carbon dioxide.

Section 95.4803. Refrigerant Containers.

Every refrigerant container or evaporator which is not a part of equipment tested by an approved testing laboratory having a follow-up inspection service, shall be constructed in accordance with the rules of Section VIII (Unfired Pressure Vessel Section) of A.S.M.E. Boiler Construction Code of the year 1946, except that compliance with paragraph U-2 to U-10 inclusive, of such code shall not be required.

Section 95.4804. Refrigerant Control Valves.

(a) A stop valve shall be installed in the refrigerant piping of every refrigerating system at the following locations:

1. At each inlet and outlet of every positive displacement type refrigerant compressor.

2. At each refrigerant outlet of every refrigerant receiver, and at each refrigerant inlet of every such receiver which is a portion of any refrigerating system containing more than 100 lbs. of refrigerant and which is equipped with a positive displacement type of compressor.

3. At each refrigerant inlet and outlet pipe of every refrigerator, and within 5 ft. of such refrigerator.

Exceptions.

The provisions of this subsection shall not apply to:

1. Any unit refrigerator or unit refrigerating system.

2. Evaporators connected in series.

3. A refrigerating system containing only one refrigerator.

(b) Stop valves installed in refrigerant lines composed of copper tubing ¾ in. or less outside diamter, shall be securely supported independent of the tubing or piping connected to such valve.

Safety Devices

Section 95.4900. Pressure Limiting Devices—Refrigerant Compressors.

(a) A pressure limiting device shall be installed on every refrigerant compressor which is a portion of:

1. Any refrigerating system containing more than 20 lbs. of refrigerant and which system operates at a pressure in excess of atmospheric pressure, and

2. Any water-cooled refrigerating system so constructed that the compressor or generator is capable of producing a pressure in excess of the highest test pressure specified in Table 51-A of this code for the refrigerant in such system.

(b) Every pressure limiting device shall stop the action of the compressor it serves at a pressure not in excess of the number of pounds specified in Table 49-A for the kind of refrigerant contained in such refrigerating system.

(c) No stop or shut-off valve shall be placed between any pressure limiting device required by this section, and the compressor it serves.

Section 95.4901. Pressure Relief Valves—Refrigerant Compressors.

(a) The following refrigerant compressors of the positive displacement type shall be equipped with a pressure relief valve of adequate capacity to prevent rupture of such compressor.

1. Every such compressor which is a portion of any refrigerating system operating at a pressure in excess of 15 p.s.i.g. in the high pressure side of the system, and which compressor has a displacement capacity in excess of 100 c.f.m.

2. Every such compressor which is a portion of any refrigerating system containing any Class 2 refrigerant.

Exception

The requirements of this subsection shall not apply to any compressor approved without such relief valve by an approved testing laboratory.

(b) Every such pressure relief valve shall be connected to the refrigerant discharge line of the compressor it serves, between such compressor and any stop valve.

(c) Every pressure relief valve required by this section shall discharge into the low pressure side of the refrigerating system it serves or discharge to the outside of the building as required by Section 95.4903 of this code.

(d) Every pressure relief valve required by this section shall be set to function at a pressure not in excess of the number of pounds specified in Table 49-A corresponding to the portion of the refrigerating system in which such valve is located and the kind of refrigerant contained in such system.

(e) No stop or shut-off valve shall be installed between any pressure relief valve required by this section and the compressor it serves.

Section 95.4902. Pressure Relief Devices—Refrigerant Containers.

(a) Every liquid refrigerant container or evaporator which is a portion of any refrigerating system and which may be wholly or partially shut off from other parts of the system by any valve, shall be equipped with a pressure relief valve or rupture member complying with the requirements of Section 95.4903 of this part.

Exception.

The requirements of this subsection shall not apply to any container or evaporator 6 in. or less in nominal diameter or where the gross volume of such container or evaporator does not exceed 5 cu. ft.

(b) Every pressure relief device required by this section shall be connected as close as practicable to the refrigerant container or evaporator it serves, and above the refrigerant level in such container or evaporator. Any such relief device shall discharge to the outside of the building as required by Section 95.4903 (e) of this part.

(c) No stop or shut-off valve shall be installed between any automatic pressure relief device and that portion of the refrigerating system served by such device, except when parallel relief devices are installed and so arranged that both relief devices cannot be rendered inoperative at the same time.

Section 95.4903. Pressure Relief Devices—Construction and Arrangement.

(a) **General.** Every pressure relief device for any refrigerant container shall comply with the requirements of this section.

(b) **Type.** Every seat and disc of every pressure relief device shall be constructed of material resistant to corrosion by the refrigerant in the container it serves.

(c) **Labeling of Devices.** Every pressure relief device shall have stamped or cast thereon, or shall have a metal label permanently attached thereto, setting forth the following information:

1. The name or trade mark of the manufacturer of such device.

2. The discharge or bursting pressure setting of such device expressed in pounds per square inch gauge.

3. The minimum diameter of the discharge outlet or opening of such valve. Every pressure relief valve shall be set and sealed by the manufacturer of such valve, or any such valve may be set and sealed in a laboratory approved by the department, provided such valve is properly relabeled.

(d) **Size of Devices.** The minimum area of the discharge outlet opening of any pressure relief device required by this section shall not be less than ½ in. in clear diameter for any refrigerating system containing a total of not more than 1,000 lbs. of refrigerant, and such outlet shall be increased not less than ⅛ of an inch for each additional 1,000 lbs. or fraction thereof, of refrigerant, but need not be more than 2 in. in diameter in any case.

(e) **Pressure Setting.** Every pressure relief device for any refrigerant container shall be set to function at a pressure not exceeding that specified in Table 49-A for the portion of the system to which the device is connected and for the refrigerant in such container.

(f) Every pressure relief device required by this section shall discharge to the atmosphere at a location not less than 15 ft. above the adjoining ground level and not less than 20 ft. from any window, ventilating opening, or exit in any building.

Exception.

Any pressure relief device for a refrigerating system containing less than 100 lbs. of any Class 1 refrigerant need not be vented through a pipe to the outside of the building.

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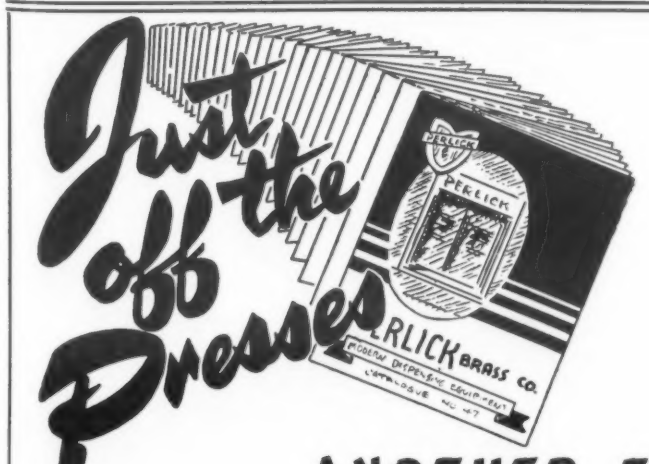

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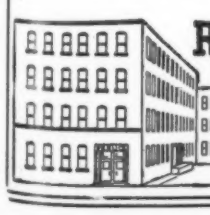

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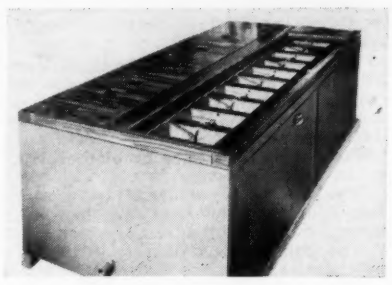

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Reco Introduces 4-Model Line of Ice-Making Units

PHILADELPHIA—A line of four portable and semi-portable bulk ice makers, capable of producing from 250 to 2,000 lbs. of ice in 50-lb. blocks, is now being manufactured by the Refrigeration Engineering Corp. here.

These units feature completely refrigerated walls whose extensive prime refrigerating surface assures even and rapid freezing without the use of a brine agitator, according to the manufacturer.

With capacities of 250, 500, 1,000, and 2,000 lbs. the bulk ice makers have a freezing time of 12 hours. All can be operated by gasoline, electric, or Diesel motors. The Diesel driven units will not be available before February, however, the manufacturer indicated.

The two smallest bulk ice makers are made in self-contained units, while all four models can be purchased for remote type installations. The two larger sizes can be equipped with a low pressure air agitator system for producing crystal ice.

All units are shipped complete with all required components including the calcium chloride to make the brine solution into which the ice cans are immersed.

Cabinets are covered with heavy sheet steel. Can covers are constructed of two layers of green oak containing several layers of heavy insulation paper, the manufacturer said.

One-Handed Tube Cutter Requires No Adjustment

* * *

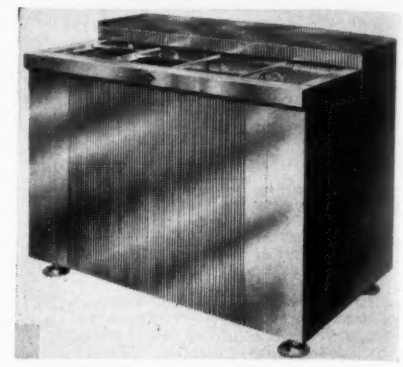
PHILADELPHIA—Claimed to incorporate a significant change in the design of tube cutters, the Capewell tube cutter was introduced recently by the Capewell Mfg. Co. here.

This cutter, according to the company, is engineered and designed to cut ¼ to ¾ in. o.d. thin wall soft metal tubing by hand pressure and with slightly less than a half turn of the handle. To operate, only one hand and no adjustment is required.

Triple cutting wheels, hand ground and specially hardened, are employed. Retracting guides insure a right angle cut with minimum burr and at the same time protect the cutting wheels, H. B. Eby, of the Capewell sales department said.

Being able to cut dented as well as perfectly rounded tubing, it eliminates the use of a hacksaw, he added.

The Capewell tube cutter has a nickel plated finish and weighs 13 oz. It is packaged for wholesale in cartons containing a dozen cutters. There are six of these cartons to a master carton. Extra replaceable cutting wheels are packaged one dozen sets per carton, 12 cartons to a master carton.



* * *

System for Bottle Cooler Unit Is 'Duct-Controlled'

PITTSBURGH—The Tyson Metal Products Co. here, manufacturer of fountain, restaurant, and bar equipment, is now marketing the new bottle cooler with a "different" kind of cooling system.

This cooler features an improved method, called "Duct-Controlled," of directing and evenly distributing the cold air throughout the box.

The stainless steel exterior of the box has been corrugated for added strength and appearance and the front rail is of heavy gauge steel to withstand rough usage. The corrugated top has been specially designed for proper drainage and glass storage. There are four sliding steel lids for easy access to the interior which is insulated with Fibreglas and contains a heavy-duty blower to maintain uniform temperature.

Elliott Bulletin Covers Line of Rotojet Products

NEWARK, N. J.—The complete new line of Rotojet tube cleaners manufactured by the Elliott Co., Roto Division, 194 Sussex Ave. here, is described and illustrated in a new bulletin just off the press.

Also shown in the new bulletin are various types and sizes of Rotojet motors for operation with water, compressed air, and steam.

Parts and accessories illustrated, include various types of heads, air valves for one-man operation, lubricators, and hose. Tables list sizes and types of tubes, and specify the Rotojet tube cleaner recommended for each.

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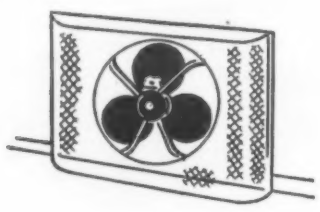

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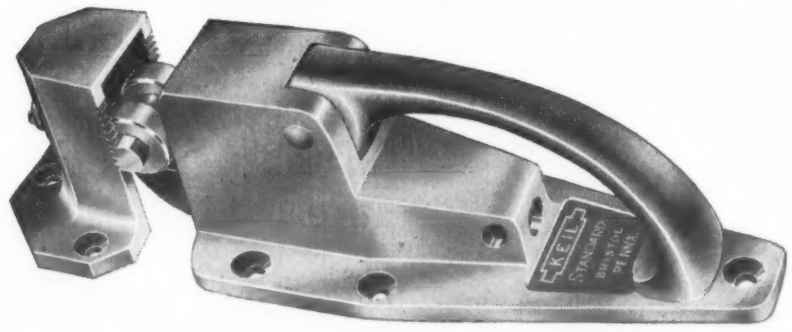

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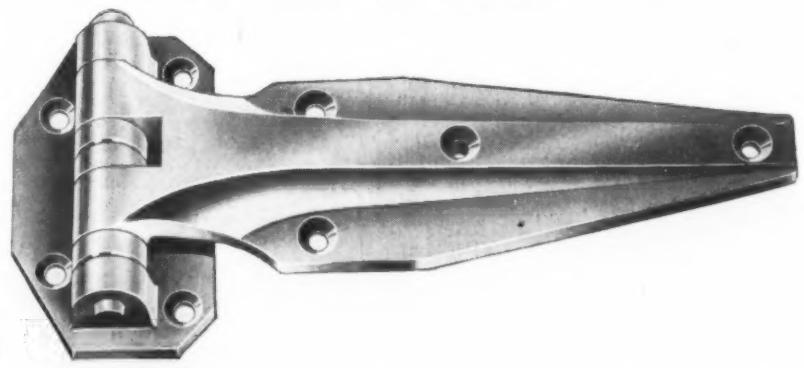

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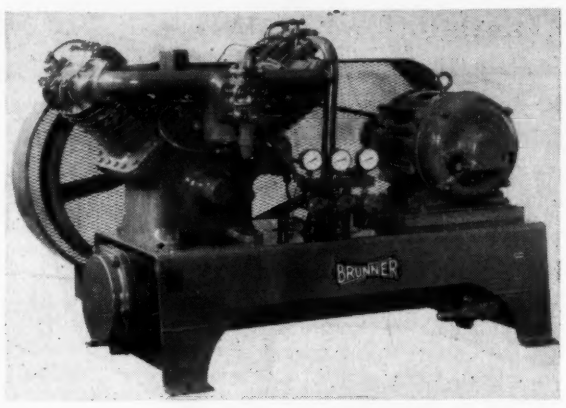
What's New (Con't)

Brunner Will Show New Condensing Unit Control



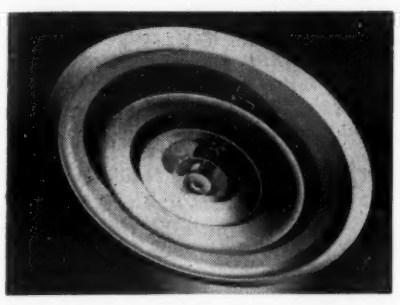
UTICA, N. Y.—A new capacity control for refrigeration condensing units, called the Brunner Suction Valve Unloader, has been developed by the Brunner Mfg. Co. here and will be exhibited for the first time at the All-Industry Exposition in Cleveland.

By means of this device, Brunner claims, air conditioning problems can be held to a closer range tolerance than in any manner previously developed.

"In this control," it is explained, "the unloader control valve controls the operation of the unloader piston. When the correct combination of suction gas pressure below the diaphragm and spring pressure above the diaphragm is obtained, the valve opens and admits discharge pressure to the top of the unloader piston.

"The valve can be made to open at any suction pressure by setting the adjustment screws."

The unloader, it is said, "meets conditions where the starting load may be much greater than the holding load required after the product or material has been reduced to the holding temperature and obtains great economies in operation."



* * *

Adjustable Knob Directs Air Flow from Anemostat

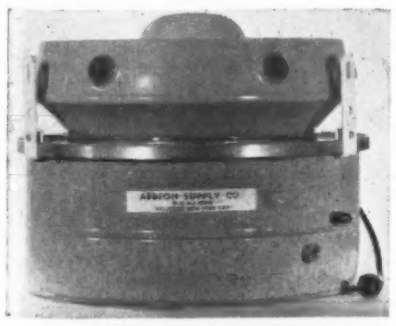
NEW YORK CITY—A new type air diffuser has been announced by the Anemostat Corp. of America, which provides any desired airflow pattern at the turn of a knob. An adjustment mechanism varies the vertical position of the third cone, thus producing different airflow patterns.

This new type air diffuser utilizes the Anemostat aspiration principle which draws room air into the device and mixes it with supply air. The amount of air drawn into the outlet depends upon the adjustment setting and varies from 15 to 35%.

This adjustable feature permits the Type C-1 Anemostat to be used for heating, ventilating, or cooling in any combination, it was said. The airflow pattern may be modified to meet changing conditions of room occupancy or seasonal weather variations.

It functions equally well mounted flush to the ceiling or on exposed ductwork, the company claims. Adjustment of the device can also be accomplished by remote automatic or manual control. Pneumatically operated control equipment may be used to adjust any number of Anemostats simultaneously.

A new latch-like method of fastening inner assembly to outer cone saves two thirds of installation time and since the inner cone assembly is instantly removable, direct c.f.m. readings can readily be taken in the neck of the Anemostat.



* * *

Humidifier's Filter Cuts Air Cleaning Time 90%

NEW YORK CITY—Expected to come off the production line sometime in January is a new Walton industrial humidifier, according to an announcement by Abbeon Supply Co., distributor.

Manufactured by the Walton Laboratories, Inc., the new humidifier features a completely covered lower pan, with the air being brought in from the bottom through a fiber-glass filter—this calculated to save 90% of the cleaning time, it is said.

Walton humidifiers, according to the company, require no steam, no pumps, no compressors; they are noiseless in operation and completely self-contained. Moisture is said to be atomized in a vapor form finer than cigarette smoke.

Additional features claimed for the new model include a vaporization capacity of over 1 g.p.h. No special water supply is necessary and a return water line is not required. Domes are available with 360° or two directional or single directional discharge. Ball bearing motor is said to draw less than 100 watts per unit (costing about 50 cents per month to operate).

* * *

Fingertip Heating Torch Produces 3,800° Flame

LOS ANGELES — Burning either butane or propane gas, a new self-contained heating torch said to produce a 3,800° F. flame has been introduced by Sully Engineering, Ltd. here.

The torch is designed for all soldering, brazing, and heating operations, and measures 12 in. long, 2¼ in. in diameter, and weighs 2½ lbs. when full. Pressure capacity of more than 2,200 p.s.i. is claimed for the torch, normal operating pressure with butane and propane being 90 to 150 p.s.i.

Fingertip control of flame size, "all-in-one" tip which eliminates need for tip changes, easy filling, and 100% B.t.u. efficiency are other claims made by the manufacturer.

Suniso Refrigerant Oil Cans Minimize Absorption

PHILADELPHIA—Suniso "G" refrigeration oils, for small refrigeration and air conditioning equipment, is now packaged in one and five gallon containers in order to minimize the risk of moisture absorption that occurred when larger drums were stored for long periods and constantly reopened, the Sun Oil Co. has announced.

Local refrigeration supply houses carry these oils in their new containers, the company added.

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SECTIONAL CONSTRUCTION

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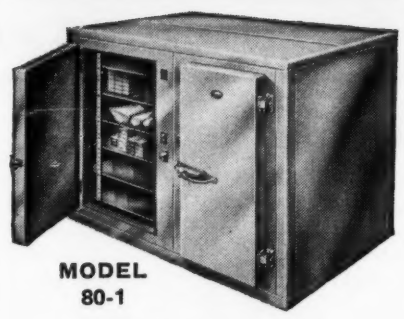
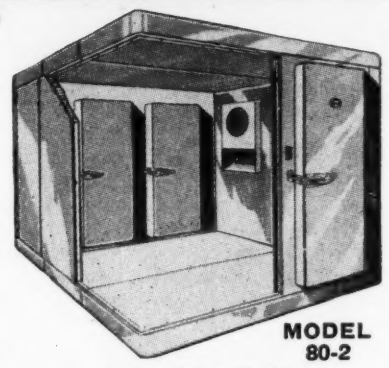


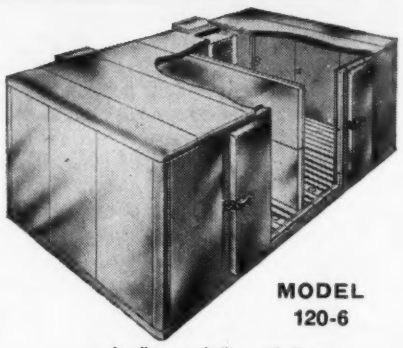
MODEL 80-1
REACH-IN OR WALK-IN
4'11" x 8'6" x 7'6" H
195 Cubic foot capacity. Ideal for Super Markets, Restaurants, Institutions. Can be equipped for Sharp Freezing and for Zero Storage.

TWO TEMPERATURE FREEZE COOLERS



MODEL 80-2
5'6" x 8'6" x 7'6" H
256 cu. ft. Standard temperature space for meat, vegetables, etc. plus 97 cu. ft. of Zero Storage or Freezer Space. Ideal for Stores, Institutions, Restaurants, Large Private Homes, Apartment Houses, etc.

LARGE BREAKDOWN BOXES AND FREEZERS



MODEL 120-6
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IMPORTANT NEWS FOR DEALERS AND DISTRIBUTORS

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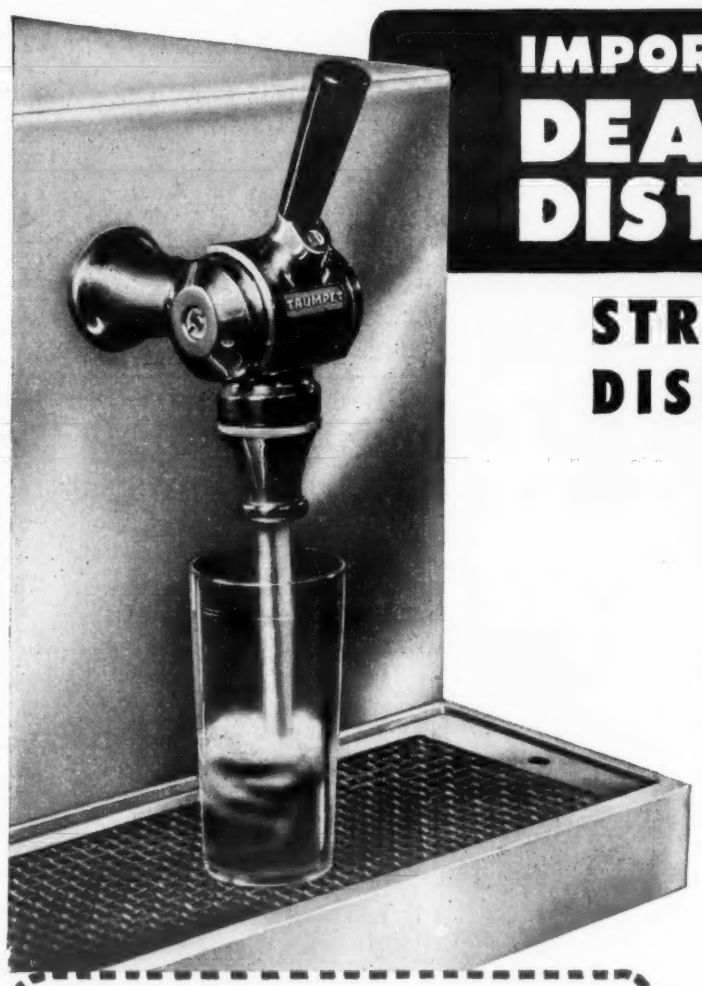

Here's the greatest recent development in bar and soda fountain equipment. It's Trumpet Select-Flo, a pressure fed beverage dispensing system that makes possible the drawing of either a perfectly mixed carbonated beverage or clear, sparkling soda water — from the same draft arm.

It eliminates hand mixing and incorrectly proportioned drinks. It banishes unsightly dispensers and space consuming bottles. Select-Flo speeds up service, cuts labor costs and widens the profit margin of each sale.

Because of its flexibility, Trumpet Select-Flo offers wide range possibilities for dealers and distributors. It is available in complete self-contained units or it can be installed in any soda fountain or bar, utilizing already existing coolers, carbonators and CO_2 tanks. Draft arms are available in three types: goose neck, straight arm and under-the-bar styles. Every bar or soda fountain, every retail establishment that sells carbonated beverages is a sales possibility. Already existing demand guarantees its usefulness and value. Test units have proven its sound design and workmanship. All faucets carry a one year guarantee against mechanical defects.

It will pay to investigate Trumpet Select-Flo Systems Now.

The mixing head in the draft arm accurately controls the proportion of syrup and carbonated water. Forward position provides a thoroughly mixed beverage in any quantity. Back position dispenses clear sparkling soda water. Middle position is the shut-off.

Select-Flo syrup tanks feature high-pressure, welded construction. Passivated stainless steel is used throughout. Special sockets make changing tanks simple and fast — no tools are required. Tanks hold a case of syrup. They may be refilled on location in a matter of seconds. Additional tanks available for standby use to assure constant service regardless of unexpected demand.

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Refrigeration Problems

And Their Solution

By P. B. Reed

For Service and Installation Engineers

Manager, Refrigeration and Air Conditioning Division, Perfex Corp.

Oil Slugging

In recent previous articles we found that the most common cause of "oil slugging" is that rapid drop in suction pressure when the compressor starts. If the compressor crankcase is not provided with an oil check-valve or if the oil check-valve does not fit on its seat tightly, the crankcase pressure drops as rapidly as the suction pressure.

RAPID DROP IN CRANKCASE PRESSURE

This rapid drop in crankcase pressures causes the refrigerant in the crankcase oil to boil out of the oil so violently that it is splashed excessively up into the cylinders and thus is pumped past the rings. Also, it is thrown back through the oil return passage, into the suction line and from there fed directly into the cylinders.

Since oil does not compress as does the gas, it cannot get out of the cylinders and through the valves fast enough, so the compressor pounds and hammers at the risk of breakage of valves, rods, shafts, and even the spokes of the compressor pulley.

A properly operating oil check-valve holds the crankcase pressure up during the momentary, rapid drop in suction pressure at the start of the run, and the oil bleeder hole allows the crankcase pressure to later purge down gradually to equalize with suction pressure. The oil-slugging effect of the rapid initial drop in suction pressure is compensated for, and very little oil-slugging occurs.

OTHER CAUSES OF OIL-SLUGGING

But compressors that are properly equipped with oil check valves, do slug oil, especially at the start of the run, on some occasions and under some conditions. Under what conditions will the oil check-valve be unable to prevent oil-slugging?

TOO HIGH OIL LEVEL

One condition is, of course, when the crankcase has too much oil in it. Most splash-feed compressors are designed so that the normal oil level is at, or somewhat below the shaft. During operation, the rods dip into the oil and splash enough oil up on the main bearings, bushings, and cylinder walls furnish sufficient lubrication. Usually there is a passage to the seal for some oil to get to it, for it too requires some lubrication.

In compressors having oil-pumps giving forced-feed lubrication through drilled passages in the shaft, rods, and bearings, the rods need not dip into the oil at all and there is less chance for oil-slugging than if the oil is mechanically agitated by churning rods.

It must not be supposed, from this reference to agitation of the crankcase oil by the rods, that it is the primary cause of oil-slugging, for it is only a contributing cause.

The primary cause is the sharp reduction in crankcase pressure, causing the refrigerant to boil rapidly out of the oil, resulting in a violent foaming or "turbulence," that itself throws enough oil up into the cylinders that oil-slugging occurs.

A high oil level may be due to too much oil being put into the system originally. However, it sometimes happens that the oil level in the crankcase is temporarily low due to temporary conditions, causing too much oil to linger in the evaporator. Then, a temperature or pressure change causes the excess oil to return, and if oil has been added in the meantime, the oil level in the crankcase is too high and there is a much greater tendency for the compressor to slug oil.

FLUCTUATING OIL LEVEL

A widely fluctuating oil level indicates erratic return of oil from the evaporator and this in turn is often caused by oil traps either in the evaporator or the suction line.

Wide fluctuations in compressor oil level are often present in systems in which two or more compressors are operated in parallel, that is, on a common evaporator. Trapped lines are not uncommon in installations using evaporative condensers or water towers located on higher levels than the compressors.

CHANGING COMPRESSORS MAY ADD OIL

A frequent cause of too much oil in the system is changing a compres-

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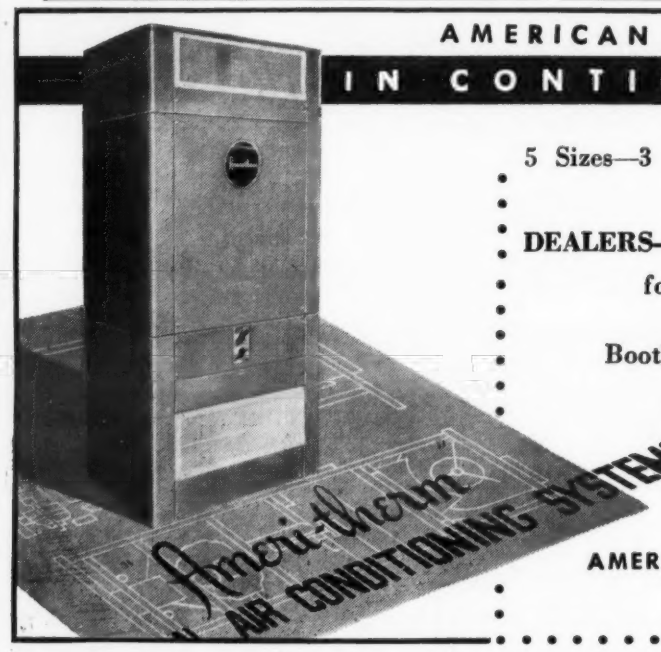
IN CONTINUOUS PRODUCTION



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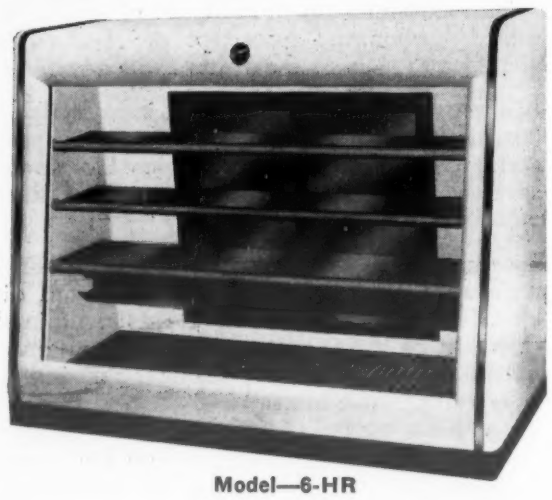
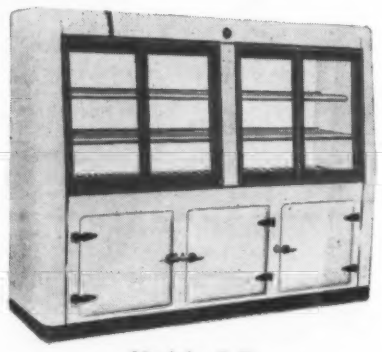

Model—6-HR
4-5-6-Ft. Lgths.

Model—5-SS
4-5-6-Ft. Lgths.

Model—8-DSS
6-8-10-Ft. Lgths.

Model—5-FSS
4-5-6-Ft. Lgths.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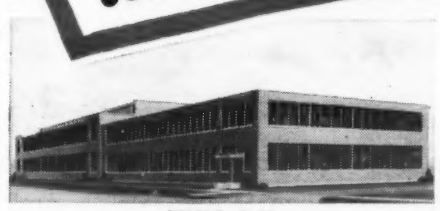
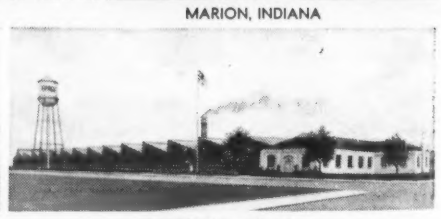
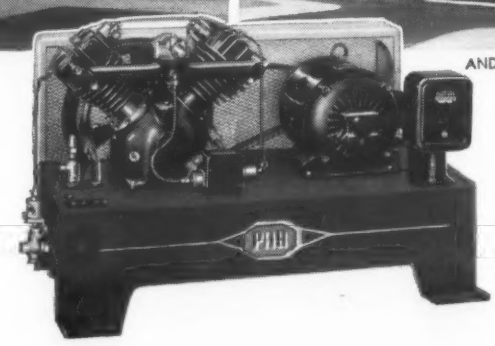

TOLEDO, OHIO


ANDERSON, INDIANA

DEFIANCE, OHIO

ANDERSON, INDIANA



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LYNCH CORPORATION
Par Compressor Division TOLEDO 1, OHIO U.S.A.

Oil Slugging--

(Concluded from preceding page)

sor. The inoperative compressor may have had very little oil in the crankcase when it was removed; perhaps its oil-slugging was the main reason for the damaged condition that made it necessary to remove it.

A rebuilt or new compressor usually has a full charge of oil in it, so the system is "over" just the amount of oil that the old compressor lacked when it was removed from the system.

As a rule, most systems are not critical as to the amount of oil in them and most compressors can stand some variation in their crankcase oil levels. However, there is bound to be some variation in the crankcase oil level from time to time, depending upon suction pressure, evaporator temperature, etc.

SMALL CRANKCASES

In recent years the demand for self-contained equipment has caused compressor manufacturers to reduce compressor dimensions as much as possible. In many cases this has resulted in reduction in crankcase oil capacity for a given horsepower or ton of refrigerating capacity, and made the oil level more critical.

EXCESS LIQUID IN EVAPORATOR

In addition to too much oil in the compressor, that is, high oil level, oil slugging, especially at the start of the running cycle, can result from the expansion valve, or whatever refrigerant flow control is used, standing partially open during the off-cycle, and thus leaking liquid refrigerant into the evaporator. The evaporator gets so much liquid in it that when the compressor starts, this excess liquid doesn't have time to evaporate to a gas, and is thus drawn back to the compressor as a liquid.

On the way to the compressor, some of this excess liquid refrigerant changes to a vapor because of the heat it gets from the suction line. If the suction line is long a great deal of the liquid may be vaporized before it gets to the compressor.

The probabilities are, however, that some, if not most, of the liquid passes directly into the cylinders. Since it is no more compressible than oil, the compressor slugs, pounds, and shudders trying to pass this liquid.

WARM TX BULB LOCATION

Perhaps the most common cause of the evaporator filling with liquid refrigerant, or at least having too much liquid refrigerant dumped into it during the off cycle, is the improper location of the bulb of a thermostatic expansion valve.

It will be remembered that a rise in pressure of the evaporator tends to close the valve, while a rise in bulb temperature tends to open the valve. If the bulb stays at evaporator temperature during the off-cycle, or within its super-heat setting of perhaps 8 or 10° above evaporator temperature, the suction pressure will keep the valve closed.

If the bulb is located away out on the suction line where it is not kept cold by the evaporator, and is warmed by room air, is in a warm air stream, or is in any other manner *warmed more than a few degrees above evaporator temperature*, this warm bulb that tends to open the valve, will overcome the effect of the suction pressure that tends to close the valve, and will force the needle off its seat. Liquid refrigerant will leak into the evaporator with the results above described. This excess liquid will cause little, if any rise in the suction pressure, which was already at saturation.

Other causes of expansion valves leaking during the off cycle are: rough or marred needles or seats, valve improperly adjusted, bulb clamp loose, or valve of the wrong type.

COLD LOCATION OF COMPRESSOR

Still another cause of oil-slugging, and this also is especially noticeable at the start of the running cycle, is the compressor being in too cold a location.

If the compressor ran continuously, this would not have too much effect, for the compressor warms up during the run.

However, during the off-cycle, if the compressor is in a place that gets colder than the refrigerator to which the compressor is connected, the refrigerant in the evaporator condenses down into the cold compressor crankcase, sometimes almost filling the crankcase full of liquid. Obviously, there is going to be a violent disturbance when the compressor is started.

SOLENOID IN SUCTION LINE

A solenoid in the suction line wired in parallel with the motor on the condensing unit has been used to prevent the condensation from the evaporator to the compressor crankcase via the suction line. When the compressor stops, the solenoid closes and shuts off the suction line during the off-cycle, and is not opened until the compressor motor again starts at the beginning of the next running cycle.

The compressor location must be colder than the evaporator for the refrigerant to condense in the compressor crankcase, but it does not have to be as cold as the refrigerator air even, for a great deal of refrigerant to be absorbed into the crankcase oil.

COLD OIL ABSORBS REFRIGERANT

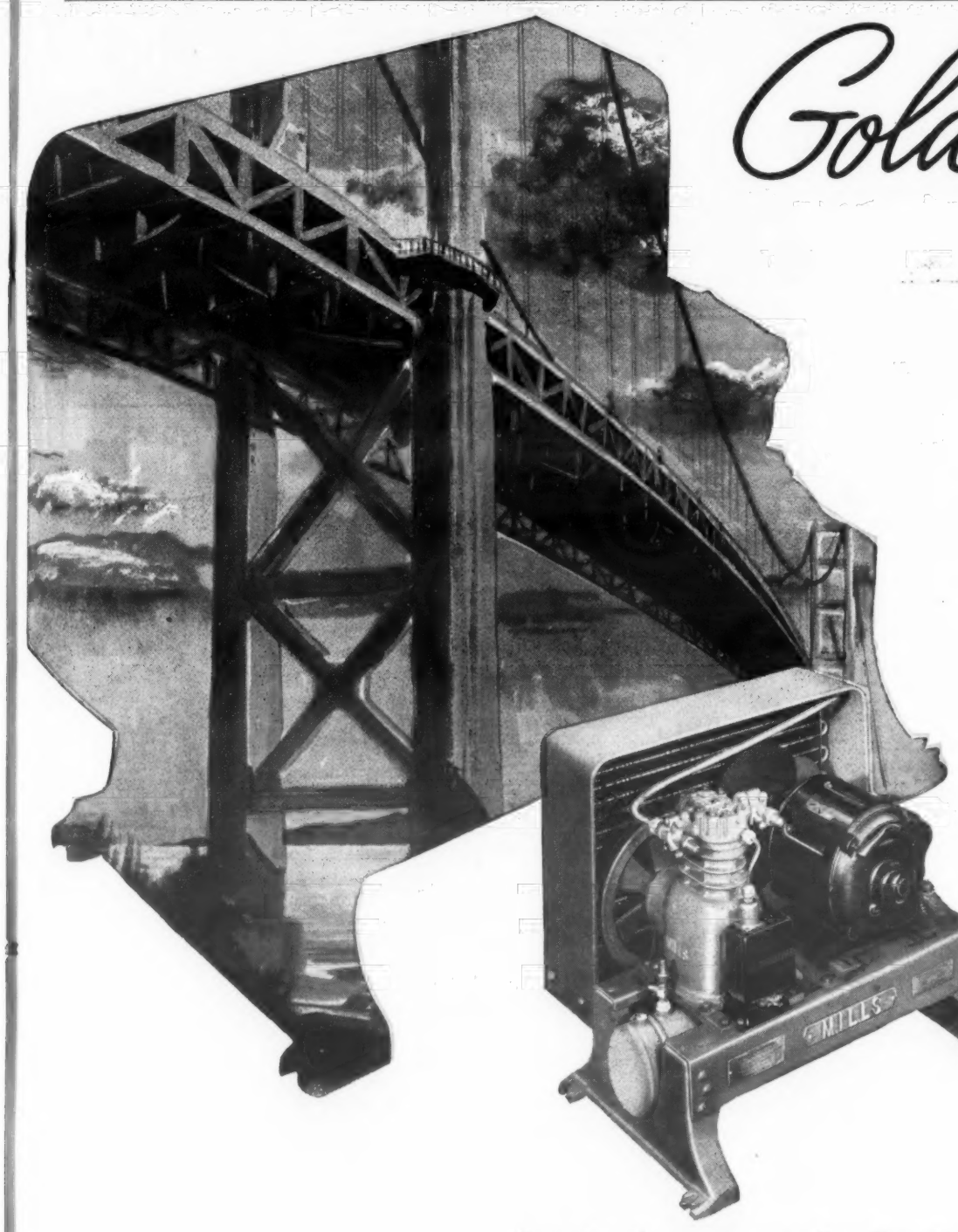
Assuming that the refrigerant is oil-miscible (and practically all of the refrigerants in use today, except ammonia, sulphur dioxide, and carbon dioxide, are oil-miscible) then the oil will absorb refrigerant simply from the suction vapor. As previously brought out in recent issues, the colder the oil the more refrigerant it will absorb. If the crankcase gets down to as low as only 50 or 60° the "oil" can be as much as one-half oil and one-half refrigerant.

The refrigerant adds volume to the oil in the crankcase, so there is bound to be some slugging, even though the oil check valve works perfectly to hold the crankcase pressure up at the start of the run, and thus allow it to gradually bleed down to suction pressure. This will prevent oil-slugging at the start of the cycle due to the initial rapid drop in suction pressure at the beginning of the run, before the expansion valve starts to feed refrigerant.

A cold high-side oil separator can be the cause of sending back to the crankcase, a mixture that, instead of being pure oil, may contain a large percentage of refrigerant in solution. In fact this mixture may be more refrigerant than oil.

Throwing all this refrigerant into the crankcase may, and usually does, cause oil-slugging. As a rule it is most noticeable at about, or perhaps shortly after the start of the running cycle.

There are other factors that may contribute to some oil-pumping, such as badly worn rings or pistons, sluggish suction valve action, etc., but they are mild in effect as compared to the heavy *oil-slugging* that results from rapid drop in crankcase pressure, too high oil level, leaking refrigerant valve, cold crankcase, and similar abnormal conditions.



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District Offices: NEW YORK • BUFFALO • PITTSBURGH • CHICAGO
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CLASSIFIED ADVERTISING

RATES for "Positions Wanted" $2.50 per insertion 50 words or under. 5¢ ea. additional word.
RATES for all other classifications $5.00 per insertion 50 words or under. 10¢ ea. additional word.
ADVERTISEMENTS set in usual classified style. Box addresses count as five words, other addresses by actual word count.

POSITIONS WANTED

ADMINISTRATIVE OR sales engineering. Ten years experience in refrigeration and air conditioning industry, including supervision of design and development group. Also production engineering, sales engineering, field service. BOX 2648 Air Conditioning & Refrigeration News.

TREASURER OF publishing company wants to live on West Coast, preferably in San Francisco Bay Area. Experience includes that of board member, corporation secretary, asst. treas., chief accountant, credit mgr., statistical editor, advertising sales representative and directory manager. Training in banking, accounting, systematizing, costs, taxes. Have a good general knowledge of refrigeration and air conditioning industry and would like to stay in that industry. University graduate, U. S. N. R. Married, 34, have 2 children. I will be delighted to furnish details as to whether I am prepared to help with any problem you may now be planning for on the West Coast. BOX 2650 Air Conditioning & Refrigeration News.

REFRIGERATION SALES & Service engineer 41, 14 years experience in the sales & service of refrigeration, air conditioning and automatic oil heating. Splendid for new dealer. Can estimate, design layout, select equipment, supervise and do any part of work. Highest type reference. Prefer warm climate. Reply to BOX 2653 Air Conditioning & Refrigeration News.

SALES AND/or service representative. Five years experience selling, installing and servicing commercial equipment. Commercial refrigeration instructor for the past year. Desires line requiring servicing and installation background. Headquarters Philadelphia. BOX 2654 Air Conditioning & Refrigeration News.

POSITIONS AVAILABLE

SALES ENGINEERS experienced in successfully selling top national-name commercial refrigeration lines to join California's most progressive merchandising organization and sell commercial refrigeration to small industrial applications. You would sell fixture lines and Mills machines. High income positions available throughout California. Write J. CORRIGAN, 4015 Wilshire Blvd., Los Angeles 5, California.

COMMERCIAL AND industrial refrigeration and air conditioning installation and servicemen with at least 3 years experience. 40 hour week, company trucks furnished, $1.80 to $2.00 scale. DRESCO REFRIGERATION COMPANY, 4404 Woodward, Detroit 1, Michigan.

EXPERIENCED SERVICEMEN and salesmen. Fastest growing city, health spot of Southwest. Profit sharing deal. Full line air conditioning and refrigeration. Ice cream freezers. Statewide territory. Excellent opportunity for men seeking permanent connection who are honest and reliable. A. A. HICKS REFRIGERATOR SERVICE, 1906 N. 4th St., Albuquerque, New Mexico.

WANTED: SALES Representative to sell air conditioning, refrigeration, heating, and electrical supplies and equipment to dealers. REPUBLIC ELECTRIC COMPANY, Davenport, Iowa.

FACTORY SALES engineer, age 28 to 38 with sales experience, plus application experience, in refrigeration and air conditioning with 5 to 50 HP compressors and condensing units. This is an opportunity to grow with a fast-growing-manufacturer. Write fully about experience and salary desired. SCHNACKE, INC., 1016 E. Columbia, Evansville, Indiana.

SALES CORRESPONDENT, age 25 to 32 with refrigeration and air conditioning engineering experience and education. Must be sales minded and know the technical questions encountered in the sale nationally of 5 to 50 HP compressors and condensing units. Write fully about experience and salary desired. SCHNACKE, INC., 1016 E. Columbia, Evansville, Indiana.

RETAIL SALESMEN who have had successful experience selling top quality commercial refrigeration lines such as Hill, Tyler, Koch, etc., to join one of California's most progressive commercial refrigeration firms. Positions available throughout sunny California. Excellent income. Write stating full qualifications. F. WILLIAMS, 1946 S. Main Street, Los Angeles 7, California.

EXCELLENT OPPORTUNITY for sales agents now calling on the refrigeration trade. Complete, exclusive beer systems, cube makers, reach-in boxes and similar equipment. Replies strictly confidential. Write BOX 2627 Air Conditioning & Refrigeration News.

SALESMAN TO contact dealers and contractors for a wholesale concern covering New England States. Opportunity to become member of the firm. BOX 2635 Air Conditioning & Refrigeration News.

WANTED REFRIGERATOR cabinet design engineer. Modern new Midwest refrigerator factory. Inquiries kept confidential. BOX 2639 Air Conditioning & Refrigeration News.

EQUIPMENT FOR SALE

OUTSTANDING CLOSE-out values. All new Trane equipment in original crates. 3 & 5 ton "Freon" compressors with motors & controls. Also 3 & 5 ton Marlo cooling coils. All equipment to be sold at reduced prices. Write or wire for complete information. ACME SERVICE & SUPPLY COMPANY, Muskogee, Oklahoma.

ATTENTION! REFRIGERATION dealers! For sale! Brand new close-coupled air cooled ½ HP condensing units complete with Tecumseh pump, ½ HP motor, air cooled condenser, receiver, service valves, etc. In quantities of ten—$93 each. Quantity discounts. BERLY MANUFACTURING CORP., 275 Atlantic Avenue, Brooklyn 2, New York.

WAREHOUSE REMOVAL—Excess inventory; new air conditioning equipment, condensing units, evaporative condensers, shell & tube condensers, fans, blowers, coils, etc. special prices to offset warehouse moving costs. Also new motors. All standard makes. BERLY MANUFACTURING CORP., 275 Atlantic Avenue, Brooklyn 2, New York.

EXCELSIOR BEER pumps—made since 1933 are again available in 2 sizes: ¼ HP and ⅓ HP. Attractive prices for dealers. EXCELSIOR MACHINE COMPANY, 2601 Kutztown Road, Reading, Pa.

QUALITY BOBTAIL fountains; reach-ins, walk-in boxes—wood, metal; dough retarders; double duty cases—stainless steel, porcelain; dairy, florist, bakery cases; ice cream hardening cabinets; thermopane frozen food cases; milk, sandwich coolers; stainless steel back bars; with machines. Equipment made to special order. FRIGITEMP CORP., 931 Bergen St., Brooklyn 16. MA 2-9093.

JACK & HEINTZ fractional horsepower motors. Complete line of various sizes: ⅛, ¼, ⅓, ½-110/220 AC 60 cycles; 115/230 AC 50 cycles. Available for immediate delivery. Maximum discounts. Export Dept., S. J. O'BRIEN SALES CORP., 560 West 34th Street, New York 1, N. Y Telephone WI. 7-2100.

FOR SALE: 6 new Pacific packaged air conditioners, ½ ton, window mount, air cooled with either open or sealed type units. (Pacific models 50 WA and 50 WAO.) $175 each. Factory cost is $231. O. K. RADIO & APPLIANCE CO., 1329 So. Staples Street, Corpus Christi, Texas.

SEALED CROSLEY TERMINALS. Installed from the outside in a few minutes without opening the compressor. Corrects leaky terminals on all Crosley "F-12" units. Set of three $5.25 (Part No. 1020) Installation tool 20¢. Immediate delivery Money-back guarantee. SEALED UNIT PARTS CO., 3097 Third Ave., New York 56, N. Y.

NEW ALUMINUM fans, 3-blade, 24" diameter, 6 degree pitch, steel spiders, ½" bore. Torrington model YL-2406. Sacrifice 500 in original crates at less than cost. U. S. THERMO CONTROL CO., 44 So. 12th St., Minneapolis, Minn.

SACRIFICE CONDENSING units new in original crates, water cooled. Copeland 3 HP $395; Hussmann 3 HP $395; Hussmann 5 HP $490; Hussmann 7½ HP $595; all complete with motors, water valves and controls. Wire or write WAND'S, INC., 1070 St. Charles Avenue, New Orleans, La.

FOR SALE: 8—5 HP Mills, 4—3 HP Carrier units, complete with motors 60% discount. 5—5 HP McQuay & Typhoon weathermakers, $495 each. 86—⅓ HP Universal, 29—½ HP crew units, less motors—make offer. All above are new in original crates. BOX 2647 Air Conditioning & Refrigeration News.

FINANCE COMPANY disposing of $55,000.00 commercial refrigeration inventory in Saginaw, Michigan. Bids accepted for entire stock. Merchandise consists mainly of Weber equipment, including freezers, soda fountains, beverage coolers, display cases, and miscellaneous compressors and motors. Letters will be sent to interested parties on request. BOX 2656 Air Conditioning & Refrigeration News.

BUSINESS OPPORTUNITIES

FOR SALE: Refrigeration and store fixture business, established for thirty years in Southwestern New York and Northwestern Pennsylvania. Net earnings over $20,000.00 in 1947. Valuable franchises. Reason retiring from business. BOX 2655 Air Conditioning & Refrigeration News.

MANUFACTURER WANTED to develop and manufacture or purchase a new and revolutionary economical cycle in refrigeration and air conditioning unit, which uses only ⅓ HP per str. ton refrigeration; can also be adapted for heat pump and for house heating. BOX 2657 Air Conditioning & Refrigeration News.

MEN TO GROW

with you

Let us send you well trained, energetic young men to help you with your sales, installation and servicing problems.

These men have had thorough *practical shop* training by refrigeration men with years of field experience. These men will develop rapidly—help you build your business. Let us know the type and kind of men you want. Men available for all parts of country.

THE ST. LOUIS SCHOOL FOR ELECTRICITY AND REFRIGERATION, Inc.

6767 Southwest St. Louis 17, Mo.

Subscribe Now

Receive the greatest trade paper in the Industry—AIR CONDITIONING & REFRIGERATION NEWS. Published every week. Brings you latest news and vital information on household refrigeration, commercial refrigeration, air conditioning, home freezers; manufacturing, distributing, retailing, servicing, and contracting. Only $5 per year, 52 issues.

Fill in coupon and mail today

AIR CONDITIONING & REFRIGERATION NEWS
450 West Fort Street, Detroit 26, Mich.

Gentlemen: Send the NEWS for one year.
☐ $5 enclosed ☐ Bill me ☐ Bill the company

Name .....
Company .....
Street .....
City..... Zone..... State.....

1-26-48

Ed Smith Will Head Penn Chicago Office

CHICAGO—Edward M. Smith has been appointed manager of the Chicago branch office for Penn Electric Switch Co. to succeed W. W. Lige, resigned, according to R. H. Luscombe, sales manager.

E. M. Smith

Smith has been a sales engineer with the Penn organization for the past 10 years, during the last 2½ years as manager of the company's Goshen territory. Previously, Smith was manager of Penn's Detroit branch office for approximately five years.

The Chicago office of Penn Electric will remain in its present location at 520 N. Michigan Ave.

Ural Joins Engineering Staff of Tenney Co.

NEWARK, N. J.—William E. Ural has joined the engineering staff of Tenney Engineering, Inc. to coordinate engineering and field applications of the firm's refrigeration and air conditioning equipment.

Formerly general manager of the refrigeration division of the Electric Power Equipment Corp., Ural also served York Corp. for 10 years as design and application engineer. He is a graduate of Penn State college.

Supply Firm Organized In Altoona, Penna.

ALTOONA, Pa. — Eastern Refrigeration Supply Co., refrigeration parts and supplies wholesaler, has been established here by Charles C. Allen and Joseph Hipps.

The store will be managed by Allen, while Hipps heads up another wholesaling firm in Greensburg, Pa., under the same name.

WALK-IN
REFRIGERATOR DOORS
(Product of JAMISON MFG. CO.)
$46.00 PER SET OF 3
—IMMEDIATE DELIVERY!
Brand new sets of 1 outside door (6" cork insulation) and 2 vestibule doors . . . all 3 Galvanized sheet metal covered front and back. Includes complete door frames and accessories.
Subject to prior sale.
Consolidated Conditioning Corp.
26 West 47th Street, New York 19, N. Y.

AN ADVANCED COURSE
In Refrigeration, Air Conditioning and Heating. Now taking enrollments for February 3, April 6, June 8 and September 7 classes. Write for booklet.
DETROIT AIR CONDITIONING INSTITUTE
4125 GRAND RIVER
DETROIT 8, MICHIGAN

Manufacturer's Closeout!

condensing units
kits and parts
at substantial savings

ALL COMPONENTS OFFERED ARE BRAND NEW AND SUBJECT TO PRIOR SALE

½ hp. condensing unit-kit
LIMITED QUANTITY—FIRST COME, FIRST SERVED

1 General Electric compressor body #CM302-D-14
1 Condenser ½ HP, 24" x 12", 3 pass
1 Receiver & Valve assembly 12 lb. capacity
1 Base, Steel with legs, 12 gauge, 14" x 26", all mounting holes punched
1 Ranco control #1402 back pressure
1 Pulley, type SA
1 Fan, suction, 4 blade, 10"
1 Goodyear belt FA46 Type B

All the above components, easily and quickly assembled, comprise a full ½ H.P. condensing unit (less motor).

closeout price, complete kit $55.00 Net, F.O.B., N.Y.C.

parts listed below are available in approximate quantities shown.

		(Each)
500	Condensers ½ HP 24" x 12", 3 pass	$8.99
2500	Receiver valve assemblies, 12 lb. capacity	4.00
1500	Pulleys Type SA	.73
2500	Belts manufactured by Goodyear FA-46 Type B	.65
3000	Bases, steel with legs, 12 gauge, 14" x 26", all mounting holes punched	1.50
500	Ranco controls back pressure, Model 1402	3.85
50	Air Compressors, suitable for Paint Spray and for Beer Installations with receiver and condenser, less motor	19.00

THESE PRICES ARE NET, F.O.B., N.Y.C., Subject to Prior Sale

Phone, Wire or Write for Immediate Action

MANN REFRIGERATION SUPPLY CO.
15 Astor Place, N.Y. 3, N.Y. GR 3-8000

ALSO CLOSING OUT A LIMITED QUANTITY OF STANDARD MAKE CONDENSING UNITS, ASSEMBLED, COMPLETE WITH MOTORS, AT SHARP REDUCTIONS.

Wire, phone or write for complete information.

Form New Concern

Ed Kellie (left) and John Trix (right) whose Aminco Products Co. will take over and expand activities of American Injector Co.

* * *

Aminco Products Co.--

(Concluded from Page 1, Column 4)

will continue in force without interruption, officials of the new firm announce.

The new company has moved into new quarters at 14544 Third Ave., Detroit 3, where it will maintain offices, manufacturing and shipping facilities, and conduct developmental work.

Products manufactured will include the Aminco line of oil separators, high side floats, water valves, snap-action valves, constant-pressure valves, strainers, starting load regulating valves, loaded check valves, line check valves, flange adapters, and pressure and vacuum setting pumps.

Additional items will be added to the line in the near future, it was announced.

Kellie, president of the new firm, has been associated with the refrigeration industry since 1919, and had been with American Injector Co. since 1935 when he took charge of engineering. In 1938 he became sales manager of the refrigeration division, and in 1941 was elected vice president. He is a member of the American Society of Refrigerating Engineers, the Refrigeration Service Engineers Society, and the Engineering Society of Detroit.

John Trix has also been associated with American Injector, starting in engineering in 1937. He became secretary of the company in 1941 and served also as assistant factory superintendent.

Heating, Ventilating--

(Concluded from Page 1, Column 3)

Central Palace here, close by the Commodore hotel where the society will concurrently hold its fifty-fourth annual meeting.

The exposition will run for five days, Monday through Friday. Show hours will be from 2 to 10:30 p.m. on Monday and noon to 10:30 p.m. for the remaining four days. The general public will not be admitted, the show being limited to those having a genuine interest, and all who attend must register before admittance, the show management has announced.

All types of air conditioning, heating, and ventilating equipment, as well as specialties for these industries will be on view on the four floors of the exhibit hall with advanced engineering practice serving as they keynote for the whole affair.

Domestic, commercial, and industrial air conditioning equipment and components who go to make up complete systems will be on display, along with a wide variety of instruments and the like employed in the development, manufacture, and installation of such equipment.

A.S.H.V.E., the organization sponsoring the exposition, has scheduled a full program for its four-day meeting which runs from Monday, Feb. 2, through Thursday, Feb. 5. Some committee meetings, the council meeting, and advance registration will actually get under way Sunday, Feb. 1.

First of the six technical and business sessions which have been programmed will open at 9:30 a.m. Monday, to be followed by the welcome luncheon in the Grand Ballroom, after which there will be meetings of the numerous technical advisory committees.

Technical sessions are also scheduled for the morning and afternoon of Tuesday and Wednesday, and the session Thursday morning will conclude the society's annual meeting.

One entire session, that of Wednesday afternoon, will be devoted to a symposium on "The Heat Pump for Year-'Round Air Conditioning." Five papers covering various phases of the heat pump will be presented at this session.

Radiant heating will also take up another technical session on Tuesday afternoon, when four papers on the subject are scheduled. This is not planned as a symposium, however.

Gives you DUST-FREE DRYING

For best results on any job...

USE PA-100,

the Preferred Refrigeration Grade SILICA GEL

Give your customers the benefits of Davison PA-100 Refrigeration Grade Silica Gel—the gel that eliminates your moisture problems. Davison PA-100 meets your every requirement—maximum capacity, fast acting, removal of acids and corrosive materials, freedom from caking, freedom from channeling, safe to use, no attack on metals or alloys—and offers the PLUS advantage of *freedom from dusting*.

Your jobber stocks Davison PA-100 Refrigeration Grade Silica Gel in factory-charged dehydrators—or in bulk in the can with the blue label.

THE DAVISON CHEMICAL CORPORATION

Progress through Chemistry BALTIMORE-3, MD.

PIONEERS AND DEVELOPERS OF SILICA GEL

Canadian exclusive sales agents for DAVISON SILICA GEL:
CANADIAN INDUSTRIES LIMITED, Sales Division, Chemical Group

★ NUMBER FIFTEEN ★

It Pays To Keep Customers Comfortable

HERE ARE some of the reasons why progressive owners of mercantile establishments have found that it pays to install air conditioning in their stores:

(1) *To attract new customers.* Not only will a new clientele be lured into the air conditioned store through the prospect of comfortable shopping, but they will deem the proprietor of that store to be an up-to-date, successful merchant who will give them the newest merchandise and the best service.

(2) *To hold old customers.* When you air condition your place of business, old customers will be proud of the improvement made in the store they have been patronizing—they will feel that they helped make it possible.

(3) *To increase sales per customer.* Shoppers linger longer, buy more, are inclined to stick around for demonstrations of "big ticket" appliances, and are more easily pleased when a store is air conditioned.

(4) *To make employes happier and more efficient.* Numerous case study records are available to prove this point. Among other things, lost time due to illness is reduced, customers are served more cheerfully and intelligently, and possible labor troubles are avoided when employes are comfortable and full of zest.

(5) *To get the jump on competitors.* First retailers in a community to install air conditioning always get credit for being the most progressive. In addition, they attract *new* trade by providing a species of comfort not offered by their competitors.

(6) *To keep merchandise clean and new.* An air conditioned store is a clean store, and merchandise kept therein is always purer, more attractive, and easier to sell.

(7) *To reduce cleaning costs.* Decorations, walls, ceilings, floors, and window displays all stay unsullied, and remain effective, when a retail establishment is air conditioned. The necessity for frequent "house cleaning" thus is avoided.

(8) *To offset poor locations.* Air conditioning will induce buyers to go out of their way to shop in comfort.

All these are wonderful reasons why a retailer should air condition his store. However, never should an air conditioning dealer let his salesmen *oversell* a retailer. Customers want relief from heat. They don't want to shiver. A 10° differential between outside and inside temperatures is usually sufficient. The old fallacy that it should be "72° inside" has frozen too many people. It has given the industry a terrible handicap in past years.

Mr. Small Town Dealer: Have you been "scared" of air conditioning? You shouldn't, because you're in a good spot to make money in this new business. And YOU can help this industry *grow*, too. Here's why: If your prospective commercial customers operate in a small town, they may find it more economical to buy air conditioning units than their brothers in a metropolis. They are likely to have plenty of cold water available, and their water and electricity costs are apt to be less. *They're prime prospects*—and they can be *sold.*

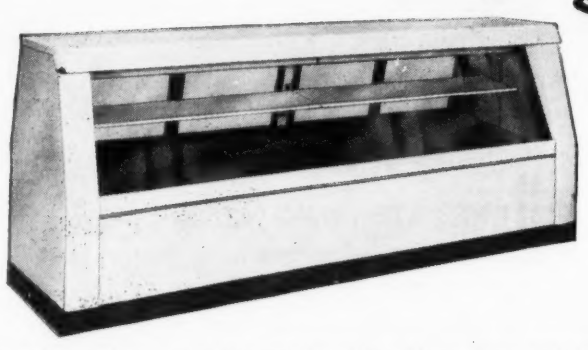
Will YOU be the dealer who cashes in on this "plus" business?

This is one of a series of 26 advertisements dedicated to the progress of the entire air conditioning industry by

NEVINGER MFG. CO., INC.

GREENVILLE, ILLINOIS

the case of the missing case



● We've got a good case, but it won't be at the Show. Care and feeding of production problems kept us from being in time. However, we are rapidly catching up. We have a number of attractive dealership and distributorship set-ups available. Write today for information.

GOLDSMAN

Manufacturers of Commercial Refrigerators

1325 N. LAWRENCE STREET • PHILADELPHIA 22, PA.

Kenyon Named Philco General Service Mgr.

PHILADELPHIA — Kenneth Kenyon, who has had many years of experience in Philco distributor and dealer work and recently was in charge of the company's world-wide field engineering for the Army and Navy, has been appointed general service manager of Philco Corp., reports Robert F. Herr, vice president in charge of service.

As general service manager, Kenyon will coordinate the work of the radio and television, refrigerator and freezer, air conditioner and other departments of the Philco Service Division.

Alter Co. Issues Biggest Catalog In Its History

CHICAGO—The Harry Alter Co. here announces that the biggest catalog in the history of the company has just been mailed. It is the Alter Spring catalog, Dependabook No. 146.

Catalogs are available by writing on your letterhead to the Harry Alter Co., 1728 S. Michigan Ave., Chicago.

A. A. Appliances Activated

LOS ANGELES—A. A. Appliances has been incorporated in Los Angeles County, with 2,500 shares of no par value capital stock. Principals are: Benjamin Haytack, Melvin E. Veale, and Leo A. Harmonson, all of Long Beach, Calif.

Neat, modern United Commercial Sales Co. parts and equipment supply store shows self-serve display islands for "buy-on-sight" items. Counter at rear is 40-ft. long.

• • •

Supply House Lays Out Parking Facilities, Store Interior To Handle Commercial Traffic Rapidly

LOS ANGELES—United Commercial Sales Co. is now in its home at 233 West 32nd St. here.

After a disastrous fire Nov. 11, 1946, United Commercial Sales operated out of temporary quarters and after a thorough investigation in an attempt to rent new quarters suitable for their business they decided that in order to render the proper type of service to their trade a building would have to be designed from the ground up in order to fill all of their requirements as a parts and equipment supply house.

There are numerous innovations designed into the firm's new building, some of the outstanding features being first, from the standpoint of a salesroom, United is operating a combination of the self-service and counter service plan.

In other words the merchandise which is primarily sold by exposure to the eye is arranged on attractive displays in the showroom where the customers may serve themselves. The more stable merchandise which is the type they request is arranged in specially designed steel bins back of a 40-ft. counter.

The arrangement of all merchandise in bins has been so laid out that the fastest and most efficient service may be given to the customers at the counter.

United has a large telephone and mail order business and one department is set up for the purpose of handling this part of the business and is housed in a separate office.

United uses the Kardex system of perpetual inventory in which daily receipts and daily sales are added and subtracted giving them at all times a very complete check of inventory and purchasing requirements. This is handled by a separate department and is housed in a separate office.

The receiving and shipping department is built to truck platform level for the convenience of loading and unloading and at the same time sufficient warehouse space is provided to house heavy equipment on this level which would eliminate the necessity of unnecessary handling of the heavier merchandise.

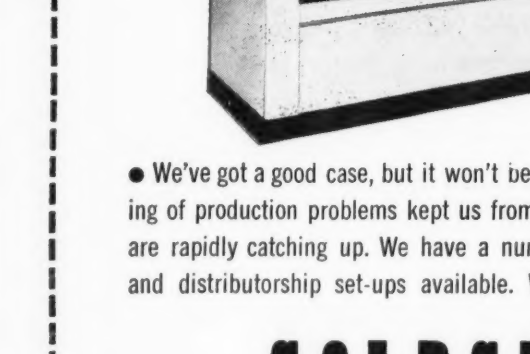
Another innovation which was built into their building is a fireproof room for the storing of all refrigerants and other inflammables such as prestolite tanks, etc. Officials of United are convinced that if they had had such a storage space for refrigerants their fire would not have been near as disastrous from any standpoint.

One of the problems that had to be given consideration was the question of customer parking. The building was designed so that parking would be immediately adjacent on one side and with the further idea of customer convenience, the main entrance to the display room and counter is from the parking lot. As about 90%, if not 100%, of the counter trade drive to this place in cars or trucks the usual direct street entrance was eliminated.

BOOTH 613

Penn BRASS & COPPER COMPANY

One TUBING IS "SUPERIOR"



'Superior' Tubing and Papco Tube Tools will be in the limelight when the curtain is drawn on Booth #613 at the Cleveland All Industry Exposition, January 26-29, 1948. Penn Brass and Copper Company will welcome all their friends, both old and new.

MAKE A DATE FOR '48. Not just this year, but for over a quarter of a century, Penn has been producing clean and bright, dry, easy bending and seamless tubing that is 'Superior'. For a truly profitable new year, turn to 'Superior' for the utmost in fine tubing. Once you have tried 'Superior', you'll agree it is what its name implies. 'Superior' will give your product limitless advantages for remember, it is four ways better. Get the jump on the market in '48—use 'Superior' for trouble free installations. Available in straight lengths or coils, 1" O. D. to capillary .093" O. D. Visit the Penn Booth #613 at the All Industry Exposition in Cleveland. You will find 'Superior' tubing and the new Papco tube tools on display. See for yourself—there is only one 'Superior' tubing.

PENN TUBING IS "SUPERIOR"

PENN BRASS & COPPER CO.

ERIE, PENNSYLVANIA • *Phone 35-111*

"Thank you, Mr. Mayer!"

THAWZONE PATENTED The PIONEER FLUID DEHYDRANT

MAYER 1842

REFRIGERATING ENGINEERS SINCE 1842

POST OFFICE BOX 6 RUTHERFORD, N. J.

October 20, 1947

Highside Chemicals Co.,
195 Verona Avenue,
Newark, N. J.

Gentlemen:

We have been using THAWZONE for the past eight years in almost all of our low temperature systems and many of our medium temperature jobs. We have applied it exactly as directed on the container and have always found it to eliminate all moisture troubles on the first application.

Over this period of time we have carefully watched all of these systems and have never found any deteriorating effect from the use of THAWZONE.

We undoubtedly will continue to use THAWZONE and do not hesitate to recommend its use for any refrigerating system, provided it is adaptable to that particular refrigerant.

Yours very truly,
MAYER REFRIGERATING ENGINEERS
John J. Mayer

ALSO MAKERS OF TRACE REFRIGERANT LEAK DETECTOR

HIGHSIDE CHEMICALS CO.

195 VERONA AVE. NEWARK 4, N. J.

BOOTH 321 AT THE CLEVELAND SHOW JAN. 26 TO 29

Walk-In Cooler Is Portable, Non-Sweating

* * *

Wooden Walk-Ins Have Self-Drying Feature For Applications Where Tile Is Not Feasible

ST. LOUIS—Wooden walk-in coolers, which are claimed to have moisture impermeability, are being constructed and installed by the refrigeration division of St. Louis Butcher Supply Co. here.

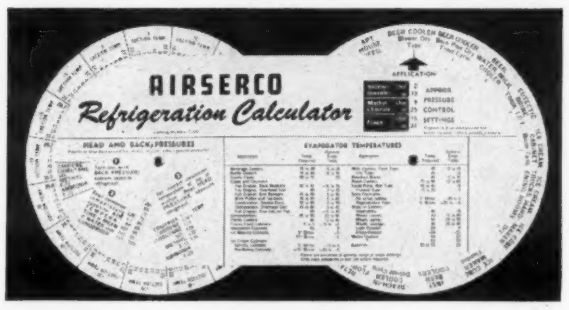
The self-drying wall feature has made it possible to install walk-in coolers up to as large as 20 x 30 ft. successfully, according to St. Louis Butcher Supply Co., in outstanding institutions such as the Mayfair hotel, St. John's hospital, the Rio Room, and the popular St. Louis supper club.

Where the institution cannot feasibly build tile-wall walk-in coolers for food products, beer, wines, etc., the dealer offers instead fir storage boxes of a portable nature, which may be assembled and set up anywhere.

For the self-drying feature, the walk-in boxes are built with exterior walls of plywood painted a battleship gray. Under the outer wall is a layer of laminated waterproof paper, sealed tightly with hot, odorless asphalt. The rest of the wall interior is filled up with Fiberglas insulation.

The outside "vapor seal" of paper and asphalt retards the penetration of moisture from the outside through the wooden walls, into the insulation. according to company officials.

Airserco Pocket Calculator Speeds Data Selection



PITTSBURGH — Airserco Mfg. Co., Inc. here, has introduced the Refrigeration Calculator, a pocket-instrument which permits rapid selection of essential refrigeration data.

To aid the refrigeration service engineer in setting low pressure controls and thermostats the calculator also selects hermetic unit motor terminal combinations, cut-in and cut-out thermo-settings, head and back pressure readings, evaporator temperatures. The rapid selection of 11 different types of refrigeration data is accomplished by means of two circular charts, mounted in a rigid plastic form. A heavy mailing envelope provides a durable case.

with

ROTARY SEAL

THE ORIGINAL, TIME TESTED, PRECISION BUILT REPLACEMENT UNITS

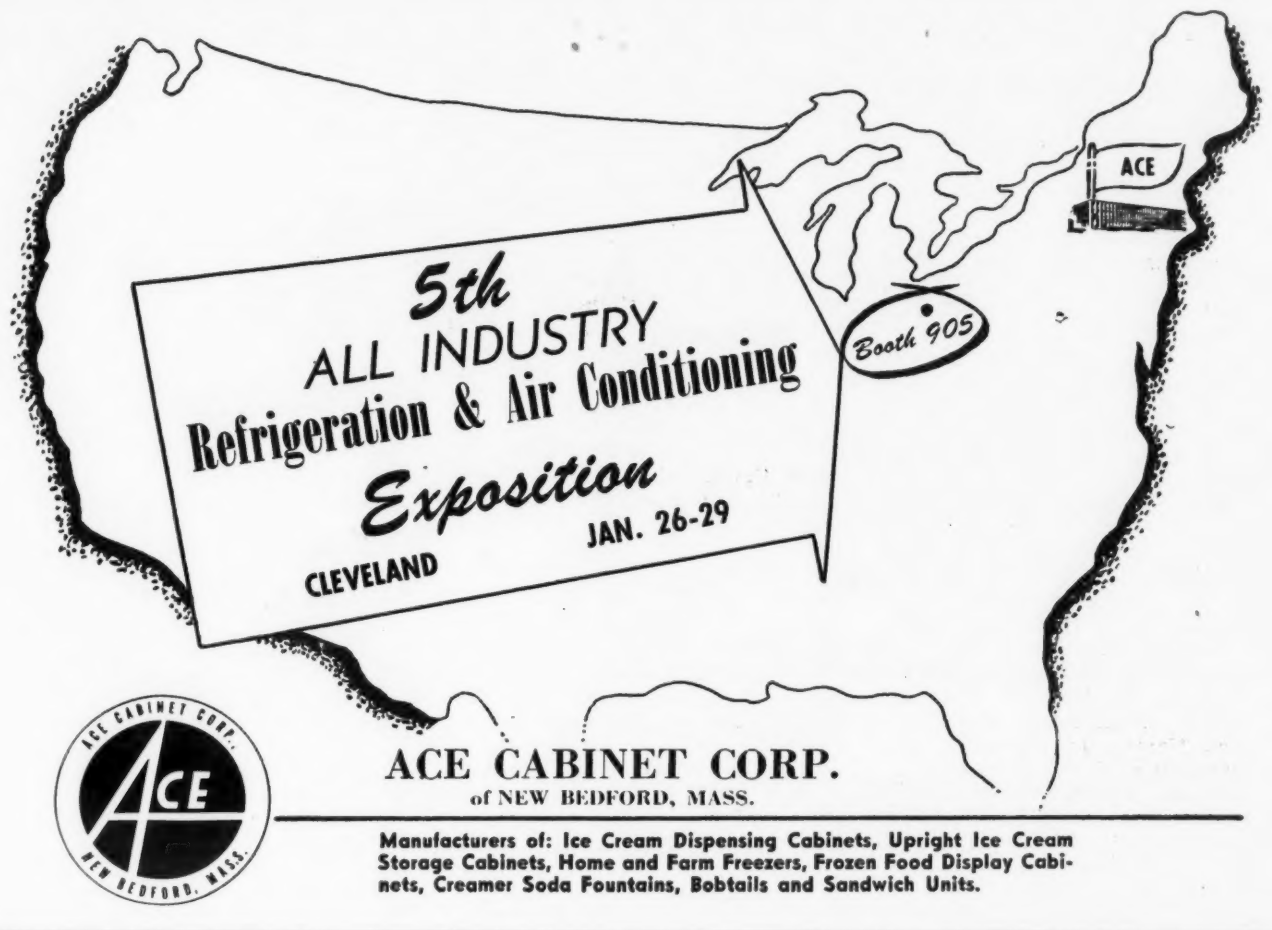
FOR COMMERCIAL, SEMI-COMMERCIAL, AIR CONDITIONING AND HOUSEHOLD REFRIGERATION COMPRESSORS

KNOWN THE WORLD OVER FOR THEIR SIMPLICITY IN CONSTRUCTION, INSTALLATION AND OPERATION

Available for over 848 models as shown on our stock list and carried by all leading jobbers.

THE ROTARY SEAL COMPANY — mechanical seals for rotating shafts

2020 NORTH LARRABEE ST. • CHICAGO, 14, ILLINOIS, U. S. A.
CANADIAN AGENT: 2025 ADDINGTON AVENUE • MONTREAL, 28, QUEBEC, CANADA



ACE CABINET CORP.
of NEW BEDFORD, MASS.

Manufacturers of: Ice Cream Dispensing Cabinets, Upright Ice Cream Storage Cabinets, Home and Farm Freezers, Frozen Food Display Cabinets, Creamer Soda Fountains, Bobtails and Sandwich Units.

THE MASTER SERVICE MANUALS - - -

— — — and other books of the Refrigeration Library are depended upon as textbooks in trade schools from coast to coast.

BUSINESS NEWS PUBLISHING CO., DETROIT

ONLY Revco OFFERS THESE 7 BIG FEATURES

1 ORGANIZED FOOD COMPARTMENTS—Separator grids permit fruits, vegetables and meats to be separated and easily found when wanted. 6.2 cubic foot storage compartment holds 250 pounds.

2 FOOD IS EASY TO REACH—Even the shortest person can easily reach every part of the wide, flat storage compartment. No lifting of heavy baskets or excessive repiling.

3 ILLUMINATED INTERIOR—Light in top of box makes all packages easy to see and identify. Lights automatically when cover is lifted.

4 SAFETY SIGNAL—Red and green bull's eye signal tells when current is off or temperature rises above danger point.

5 QUIET REFRIGERATION UNIT—Dependable, hermetically sealed unit built by one of the country's best known manufacturers. Thoroughly tested in laboratory and in actual use. Extremely quiet.

6 EFFICIENT CABINET DESIGN—Cabinet food compartment has refrigerating coils on all sides for even, intense cold. Heavy 4½" Fiberglas insulation holds cold and reduces operating cost.

7 SPARKLING MODERN APPEARANCE—Smooth exterior makes Chill Chest easy to keep clean. No dirt catching corners or moldings. For top value in home freezers, remember Revco Chill Chest, the freezer that is built to last.

DISTRIBUTORS: *Sell the Home Freezer with trouble-free performance. Perfect for locker plant dealers. A real opportunity for livewire distributors to make big profits. Write or Wire.*

Revco INC. DEERFIELD, MICHIGAN

Dealer Assn. Plans on Trade-Ins, Service--

(Concluded from Page 1, Column 3)

distributor relations, installation problems, service responsibilities, trade-ins, the rural market, better business efficiency, and sales promotion.

Among other things, the conference authorized NERA to recommend:

1. That manufacturers, distributors, and electric companies unite with NERA in a comprehensive nationwide program to recruit and train 100,000 men and women for appliance-selling careers. (The association was authorized to prepare such a program.)

2. That distributors guarantee to sell to franchised outlets only, that dealers ask for model-protection and minimum 90-day price protection clauses in all franchises, and that all manufacturers mail discount schedules direct to their dealers.

A report on manufacturer-distributor relations by General Chairman and NERA President Herb Names, of Herb Names, Inc., Denver, said the association believes:

1. That manufacturers should examine their territories and franchise according to market population, remembering to keep the number of dealers down to where the line is profitable to distributor and dealer alike, and that in each dealer franchise a clause should be inserted which says the distributor agrees and guarantees there will be no sales of the product made to any group or individual except those franchised.

"We have accordingly recommended," the report said, "that our national association prepare such a statement and submit it to each member, encouraging the dealer to have the agreement included in every franchise he signs."

2. That manufacturers rigidly supervise their distributors and jobbers so it will be virtually impossible for the consumer to buy anywhere except through regular retail channels, and that the industry should definitely discourage "back door" and special discount selling to employe groups, whether within or without the industry.

3. That the dealer should not be circumvented in builder or multiple purchase sales to the builders; that the question of where the quantity line, if any, should be drawn should depend on what the dealer desires to handle and is able to handle; that all builder sales in quantities up to six should be channeled through the dealer at his regular profit and that the distributor should cooperate with the dealer to see that the proper allocation of merchandise is shipped from the factory to handle the requirements; and that on quantities over six, the distributor should first open the sale to competitive bids and then cooperate with the dealer according to the dealer's ability to handle the transaction—then if the dealer is unable to handle the sale, the distributor should act for the manufacturer.

4. That it is grossly unfair ever to load a dealer's inventory with items which the public doesn't want, because the merchandise is off-brand or in over-supply, and which the dealer therefore cannot sell except at a loss.

A report on service responsibilities by General Chairman M. E. Brunderman, of Brunderman Appliance Co., Chicago, recommended:

1. That manufacturers should allocate merchandise only to dealers who perform service themselves or have adequate facilities available for that service in order for the greatest amount of goodwill to result for the entire industry.

2. That the manufacturer and distributor should carry a full stock of parts—even though it might reduce the number of complete units produced. They should also ship these parts promptly and shipments should be prepaid on a memo charge basis rather than a cash basis, where the part is in guarantee.

3. Credits on replacement units under warranty should be handled promptly in order to increase customer satisfaction and free dealer capital from carrying the cost of the replacement unit on his books, thereby tying up valuable capital investment.

A report on trade-ins by General Chairman F. E. Morrison, of Rockford (Ill.) Standard Furniture Co., said "it is appalling the number of dealers who think that they will be able to stay in the appliance business without handling trade-ins." It predicted that as soon as supply catches up, dealers may well average two trade-ins for each sale.

A program of education for dealers as to where the market for trade-ins is and the profitable way to handle the trade-in business is needed, the report pointed out. It urged manufacturers to back the program solidly "in order to get the maximum cooperation of all dealers."

According to the report, NERA has recommended that its dealers attack the trade-in question through proper appraisal, proper reconditioning and a 90-day guarantee, adherence to NERA's 15-point program for advertising used appliances, and sales.

With regard to reconditioning, the report pointed out that "many of the more far-sighted dealers have recognized that if the size of their store and its capital permit, they must set up their own reconditioning departments in order to be successful."

The report recommended that manufacturers:

1. Officially approve and endorse the NERA program for handling trade-ins.

2. Officially approve and endorse the NERA 15-point program for advertising used appliances, to be enforced locally through advertising clubs, Better Business organizations, and local newspapers.

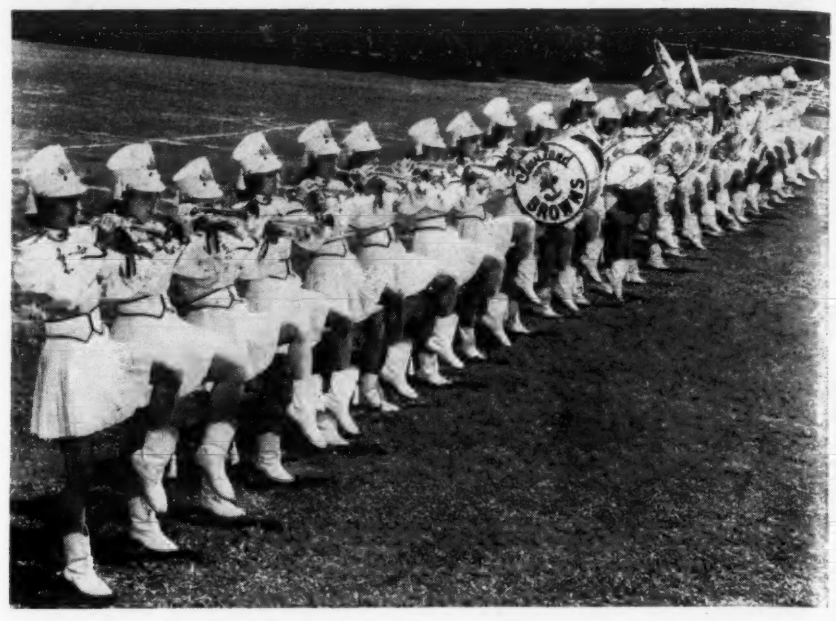
3. Support the NERA program for "OK'd" appliances, whereby NERA members will adhere to definite reconditioning standards and advertise the fact for greater public acceptance.

4. Give NERA full support in any market surveys to be made in the future pertaining to trade-in prospects.

A report on installation problems by General Chairman Wendal Lewis, manager of the appliance department of Klode Furniture Co., Milwaukee, recommended the following ways available for reducing "the high cost" of appliance installations:

1. Adequate wiring—in present construction, and particularly in new construction, will lessen the cost of installation future appliance purchases.

2. Pooling of installations—a program for dealers and contractors to work together would result in reduced labor costs.



"Majorettes" marching and entertaining musical unit of the Cleveland Browns football team will be part of the entertainment at the All-Industry Exposition banquet Wednesday night, Jan. 28. There will be continuous entertainment and dancing from 7:30 p.m. on.

3. Electric companies participating in installation costs.

4. Less restrictive city or other codes wherein certain restrictions requiring specific materials and methods are eliminated.

5. Cooperative action with the National Association of Electrical Contractors and National Association of Master Plumbers in order to discover a solution to the various phases of the installation problem, incident to plumbing and wiring.

6. A program of public relations to bring all segments of the industry together, with a view to selling more appliances.

Cylinder Shortage--

(Concluded from Page 1, Column 2)

loaded cylinders far in excess of the empty ones returned. They have placed large orders for new cylinders. Due to the steel shortage, however, delivery of these is slow.

They stress that ICC Specification cylinders should be used for shipping only, and not for storage.

Raw materials for making "Freon-12" are short, but not critically so. Present and new factory capacity appears to be adequate. Lack of cylinders is the only bad bottleneck.

ATTENTION ENGINEERS AND METALLURGISTS

File this metal treating guide for future reference. Write or call ACP at Ambler for additional information on any of the following chemicals and processes.

ALUMINUM
Cleaning . . . . . Deoxidine, Duridine
A C P Ridolines and Ridosols
Preparation For Painting . Alodine, Duridine, Deoxidine
Protection From Corrosion . Alodine

BRASS
Brightening . A C P Bright Dip No. 1
Cleaning . . . . . Deoxidine, Duridine
A C P Ridolines and Ridosols
Cleaning For Painting . Deoxidine, Cuprotek
Corrosion prevention . Cuprotek
Soldering Flux . . . . . Flosol

CADMIUM
See Under Galvanized Iron

COPPER
Brightening . A C P Bright Dip No. 1
Cleaning . . . . . Deoxidine, Duridine
A C P Ridolines and Ridosols
Cleaning For Painting . Deoxidine, Cuprotek
Coating Steel With Copper Cuprodine
Corrosion Prevention . . Cuprotek
Scale Modification . . . Ridoxine
Soldering Flux . . . . . Flosol
Stripping Copper Coatings Actalyte
A C P Copper Stripping Soln. No. 1

GALVANIZED IRON
Cleaning . . . . . Duridine
A C P Ridolines and Ridosols
Phosphate Coating, Paint Preparation . . . . . Lithoform
Soldering Flux . . . . . Flosol

IRON AND STEEL
Chromate Coating, Paint Preparation . . . . . Cromodine
Cleaning . . . . . Deoxidine, Duridine
A C P Ridolines and Ridosols
Cleaning For Painting . Deoxidine, Duridine
Coating With Copper . Cuprodine
Paint Stripping . . .
Caustic Soda and Solvent No. 3
Phosphate Coating, Paint Preparation . . . Granodine, Duridine . . . Thermoil-Granodine
Pickling With Inhibited Acids Rodine
Rust Prevention For Unpainted iron . . . . Peroline
Rust Removal—Brush, Dip, Or Spray . . . Deoxidine
Soldering Flux . . . . . Flosol

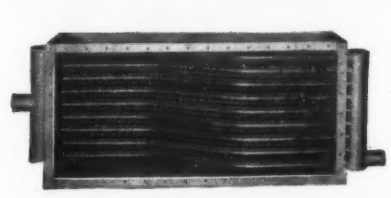
MAGNESIUM
Cleaning . . . . . Duridine
A C P Ridolines and Ridosols
Pickling . . . Rodine (M-200)

STAINLESS STEEL
Cleaning . . . . . Deoxidine
Coating With Copper . Cuprodine
Pickle Polishing . . . . . Rodine
Soldering Flux . . . . . Flosol

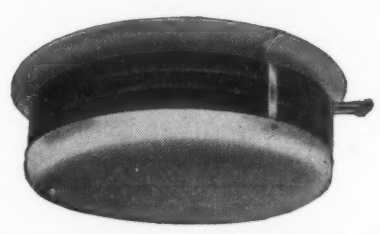
ZINC (See also under Galvanized Iron)
Corrosion prevention . . Zinodine

MANUFACTURERS OF METAL-WORKING CHEMICALS AND INHIBITORS

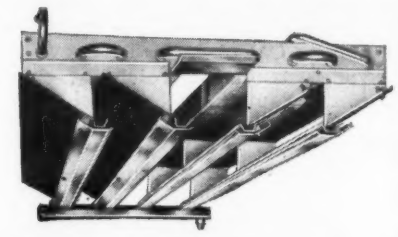
AMERICAN CHEMICAL PAINT CO.
AMBLER, PA.



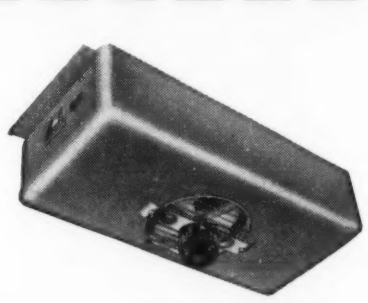
1 BUSH STEAM COIL — Available in five standard finned heights and variable lengths with casings to match corresponding DX coils.



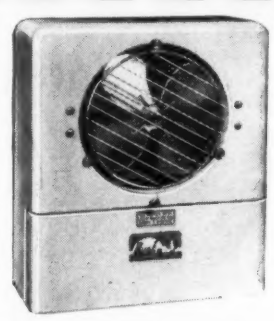
2 BUSH CEILING JET Maximum efficiency in minimum space. Less than 13" of head room in most models. All weight is on four hangars.



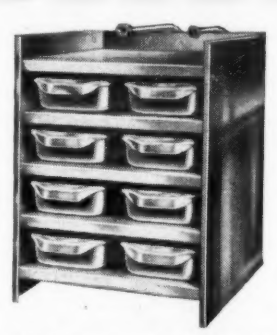
3 BUSH PLASTI-COOLER — Jet-black plastic baffles eliminate sweating . . . enhance appearance. Scientific pitch for maximum air discharge.



4 BUSH C-W UNIT COOLER Ceiling or wall mount. Case of galvanneal steel, with white enamel finish.



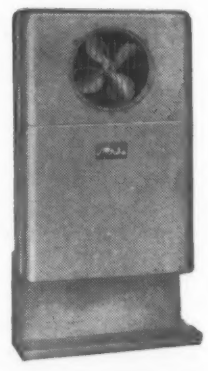
5 BUSH JR. WALL MOUNTED COOLER Compact . . .high capacity . . . easy to mount . . . accessible for service.

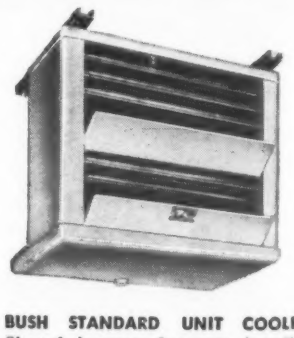


6 BUSH STANDARD ICE-MAKING COIL —A wide variety of models available with 12 to 48 pound ratings.

7 BUSH WATER DEFROST UNIT COOLER —Defrosts with tap water in less than five minutes. Cuts costs.

8 BUSH WALL MOUNTED PANEL COOLER Compact . . . ideal for low ceiling walk-in coolers . . . leaves headroom all free.





9 BUSH STANDARD UNIT COOLER Slotted hangars for easy installation. Models to fit all applications.

9 WAYS TO MAKE MONEY

SEE BOOTH 610 AT THE SHOW

Because BUSH Heat Transfer Products are scientifically designed, expertly manufactured to top quality standards, and accurately rated they are naturally easier to sell, faster to install, and require less service. This means more profit for you. When your customers discover these advantages it means more business for you, too.

Get acquainted with the BUSH Factory Representative in your territory. He is an expert refrigeration and air conditioning engineer . . . a good man to know. You will find him alert to the application of newest heat transfer principles and thoroughly conversant with latest installation techniques. Let him help you with plans and specifications on your next important job.

BUSH Heat Transfer Products are NOW *available through leading refrigeration and air conditioning wholesalers everywhere.*

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